

INFO WORLD

Defining Technology for Business

Local broadband

Merger partners bring wireless home

By Jennifer Jones and Cathleen Moore

SPRINT EXPECTS to announce this week that it has completed a series of acquisitions that form the cornerstone of its plan to provide broadband services directly to homes and businesses with MCI WorldCom.

The two companies are poised to begin a rollout of a national footprint of MMDS (Multi-channel Multi-point Distribution Service) fixed wireless technology as a way of breaking into local markets. With the plan, MMDS broadband tech-

nology will become a rival of DSL and cable modems, and is a crucial part of the vision behind the merger of the two companies.

"Right now we are looking at deployment and rollout plans. This is a huge focus for our group, which is evaluating equipment and technology and building marketing plans and advertising strategies," said Todd Rowley, vice president of spectrum management at Sprint's Wireless Broadband group.

In fact, this year is pivotal for the companies' MMDS ramp-up. Both Sprint and MCI WorldCom are

► **BROADBAND** page 30

PDAs learn to listen up

By Ephraim Schwartz

AT THIS WEEK'S Demo 2000 conference, Lernout & Hauspie will make the concept of the handheld computer one step further by demonstrating a prototype voice-controlled PDA (personal digital assistant).

The prototype, code-named Nuk, incorporates three innovations: It is the first handheld to include a large-vocabulary speech-recognition engine, it runs on a mobile version of the Lin-

ux operating system, and it uses Intel's next-generation StrongArm II low-power chip for handheld devices. Its name is an abbreviation of the Hawaiian word Nukulu, meaning echo.

The device will give users with a wireless connection voice access to Web sites for e-commerce transactions such as buying and selling stocks or ordering books online as well as the ability to read and send

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Pocket intranet: AvantGo tools provide a centralized solution for sending corporate content to mobile devices. 71

Dot-com dizziness: Sean puts his own special spin on the question of Internet spin-offs. 73



Whether you embrace it or avoid it, you simply can't ignore Windows 2000. *InfoWorld* covers all the angles to help you determine your upgrade strategy

TEST CENTER ACTION PLAN

A step-by-step process aids admins in pursuit of the perfect migration.

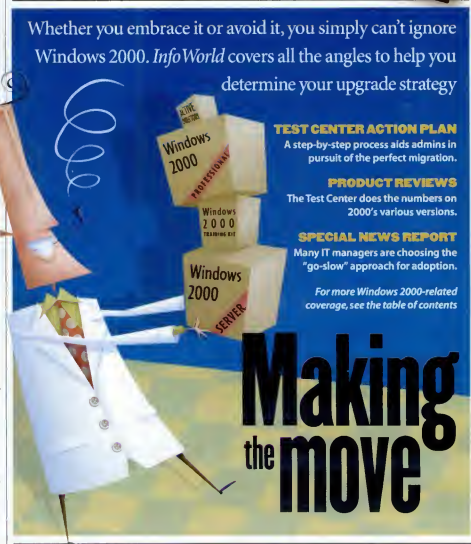
PRODUCT REVIEWS

The Test Center does the numbers on 2000's various versions.

SPECIAL NEWS REPORT

Many IT managers are choosing the "go-slow" approach for adoption.

For more Windows 2000-related coverage, see the table of contents



Making the move

Internet as platform

Vendors are redesigning their products to combine software and services into a single environment

By Bob Trott, Ed Scammell, and Michael Latrig

EVEN AS THE PENDING release of Microsoft Windows 2000 promises to shake up the operating system landscape in the coming year, the IT industry's platform providers are busy redefining the ways that companies deliver and design software

and services over the Internet. Microsoft, IBM, and Sun Microsystems are separately rebuilding their operating systems and middleware around the model of Internet-based services that corporate customers can

connect to from the Internet, rather than installing a single, all-

► **PLATFORMS** page 30



L&H'S NUK prototype uses voice recognition as its primary interface.

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Mentor's Corner

Kip Pendleton grew DirectAg from an online seed store into a virtual one-stop for agribusiness
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WINDOWS 2000

Making the Move

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FORUMS

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- **Test Center:** Does Windows 2000 have what it takes for enterprise-level security? Will a recently discovered and patched security hole mean that the PR damage has already been done?



- **Bob Lewis:** Can you convince Bob that Linux can be equally successful on the desktop? Stranger things have happened.
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Newsletters

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- From the Ether, by Bob Metcalfe
- Notes from the Field, by Robert X. Cringley
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- Net Prophet by Sean M. Dugan
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- The Linux Report

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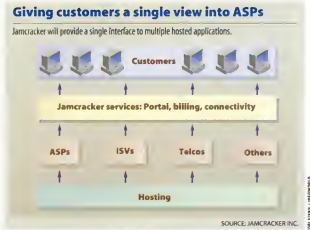
■ Market confronts need to coordinate

By Dan Brody

THE EMERGENCE THIS WEEK of a new venture underscores the growing concern about application interoperability that the ASP (application service provider) boom has brought forward. As ISVs scramble to rewrite their software products to fit the outsourcing model, a lack of interoperability standards for functions such as billing could come back to haunt the industry.

The man credited with revolutionizing Internet hosting when he founded Exodus Communications in 1994 is aiming to do the same to the fledgling ASP market. K.B. Chandrasekhar will launch his company, Jamcracker, this week in the hopes of creating a new category of ASP, known as the aggregator ASP, or AASP.

By offering a buffet-style selec-



tion of applications, Jamcracker is hoping to give companies multiple IT and ASP services through a single portal.

"From an ISV perspective, a stan-

dard set of ASP services is something that is needed," says Jan Jackman, vice president of strategy at IBM's global Net Generation business, in White Plains, N.Y. "It's still

early on, and this is either going to be a landgrab or an open market."

For their part, IBM is talking to its partners to develop optimal methodologies, and there is the potential that Big Blue could put forth a proposal to the ASP Consortium as a possible solution. But Jackman admits that a future of fragmentation looms.

The ASP Consortium recognizes the need for standards, but has been ill-prepared for the crush of popularity in the ASP market. The Consortium has established a "best practices" group, but has yet to create the solidarity needed to quickly and effectively drive standards throughout the burgeoning industry.

"If there were a standard it would make our efforts less complex," says Paula Hunter, a spokesperson for the ASP Consortium. "There is a fundamental sharing of data that needs to go on."

ASPs are anxious to see the results of such standards, but can't stand still in the meantime. Notoriously slow, standards bodies can't keep up with the pace of development in the ASP market, forcing

many ASPs to do the work themselves.

"Any type of organization that will bring top companies together to come up with cross-vendor standards is advantageous," says Bryna Kaplan, manager of product engineering at USInternetworking in Annapolis, Md. "This is a very important issue for us, because we offer a full set of applications."

USInternetworking has already done much of the interoperability work necessary to enable its applications to exchange data. The company has created a bridge between its Siebel and PeopleSoft offerings.

The dearth of standards has also opened the door for companies such as Jamcracker, which, through the use of XML, will do much of the work to allow disparate applications to exchange data. The company will make a single sign-on, secure portal, called Jamcracker Central, for ressource companies lacking the ressource to both host and integrate their data internally.

Jamcracker Inc., in Sunnyvale, Calif., is at www.jamcracker.com.

E-commerce

RosettaNet pieces begin falling into place

By Eugene Grygo

THE ROSETTANET XML-based supply chain management standards for IT manufacturers passed their first hurdle last week with e-Content Readiness Day, fueling speculation that the methodology of this effort could be cloned in other vertical markets, given significant buy-in from major players.

The readiness event was a test

of XML in a business-to-business production environment. RosettaNet members Intel, 3Com, and CompUSA had implemented standards based on the PIPs (Partner Interface Processes) of the RosettaNet XML-based guidelines for dialogue between business partners.

The key to success for RosettaNet appears to be the deeper level of integration and collaboration that the

consortium has been able to achieve, said Kenneth Vollmer, an analyst at Giga Information Group, in Cambridge, Mass.

The RosettaNet standards require trading partners to go through all of the steps of a business process rather than the one-off orientation of EDI (electronic data interchange), Vollmer said. "All this will lead to tighter integration and better collaboration between trading partners, and that is the bottom

line," he said.

While RosettaNet standards may be headed for widespread acceptance among IT manufacturers, there are nontechnical issues that may bar its broader usage, according to industry observers.

"RosettaNet can certainly be cloned if there is the political will within an industry to cooperate on the basic business processes," said Geoffrey Bock, an analyst at the Patricia Seybold Group, in Boston. The highly competitive health care industry, for example, is unlikely to adopt the approach, he said.

The nonprofit HR-XML Consortium has looked to RosettaNet initially to review its methodology,

said Chuck Allen, HR-XML Consortium chair. "We hope to apply what works," Allen said. The HR-XML group has gotten early support from companies such as PeopleSoft, SAP, Oracle, and Lawson Software, Allen said.

Separately, IBM last week submitted to the Organization for the Advancement of Structured Information Standards (OASIS) its TPA (trading partner agreement), an XML-based specification that would provide a standardized format for contracts across industries.

RosettaNet, in Santa Ana, Calif., is at www.rosettanet.org. IBM Corp., in Armonk, N.Y., is at www.ibm.com.

Vertical markets nearing hypergrowth

By Geneva Sapp

WHILE THE INITIAL wave of business-to-business e-commerce leveraged extranets to automate offline processes, the next wave of dynamic interactions is supplanting stagnant point-to-point connections of the past, most prominently in vertical marketplaces.

As a result, by 2004, business-to-business e-commerce will barrel past \$7 trillion in the United States, according to a new Gartner Group report.

"Even in the U.S. market, business-to-business has not even hit hypergrowth yet," said Yarda Lief, a senior analyst at Forrester Re-

search, in Cambridge, Mass.

Lief believes that hypergrowth will be triggered by the effect of e-business networks.

EC Company has found a niche in translating data interchange between small and midtier companies that can not afford to implement EDI (electronic data interchange), but need to be able to compete in vertical marketplaces.

"The problem is that EDI costs \$25,000 minimum to get started and the ongoing maintenance is a real headache," said Andrew Duncan, president and CEO of EC Company.

"So about 7.4 million companies that need to be electronically enabled ... can't because it's too technically difficult and too costly for them."

E-market maker VerticalNet is announcing a partnership this week with EC Company in order to use EC's ability to reach small and midtier companies. The partnership brings another 1,000 companies to the more than 50 already within VerticalNet's industry specific trading communities.

Microsoft, not to be left out, invested \$100 million in VerticalNet last month.

Small and midsize market suppliers and buyers will have access to VerticalNet, with EC Company aggregating the dissimilar data formats for those not already electronically enabled.

Power players from general e-procurement markets are also leaping into vertical markets. Ariba and Commerce One have both begun targeting the oil and gas market.

In addition to linking with Chevron, Ariba's acquisition last week of Trading Dynamics brought it a cobranded relationship with pennNET — a business-to-business vertical market player launching this week — making a play into the oil and gas market first.

With the dynamic nature of vertical markets attracting so many e-procurement market makers, the

line will soon blur between vertical and horizontal markets, according to analysts.

VerticalNet Inc., in Horsham, Pa., is at www.verticalnet.com. EC Company, in Palo Alto, Calif., is at www.eccompany.com. Ariba Inc., in Mountain View, Calif., is at www.ariba.com.

For the record

In our Nov. 8 review of BlueStone Visual XML 1.1 (see "Visual XML eases integration," page 57), the server component was incorrectly identified in the Bottom Line box as Sapphire/Web 6.1 XML Server. The correct name is XML-Server.





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DEMO 2000 SHOWCASE

New technologies

Wireless, business services debut

By Ephraim Schwartz
and Brad Stevenson

DEMO 2000 attendees this week will see the latest ideas for making businesses more automated and efficient, and get a glimpse at the latest consumer gizmos.

This year the show, which is in Indian Wells, Calif., focuses on an array of business application suites and e-commerce development tools designed to help businesses ramp up quickly.

Loudcloud Inc. will be showing its new Cloudware Product and Service line, which combines software and operations to run the back end of Internet businesses. Outsourced services such as application services, databases, security, payment, management, monitoring, user registration, and e-mail are all packaged to run on Loudcloud's Opsware.

Walking to the same beat is

Thinkfree Office, a free Web-based suite of office productivity applications that is able to scale to meet users' needs. Running on Microsoft Windows, Linux, Unix, and Macintosh platforms, Thinkfree is compatible with Microsoft Office and works on or offline.

Web site owners looking for a more perfect Internet might find it when Utipia unveils its syndication network, combining content, commerce, and a community of subject-matter experts. Intended to increase "stickiness and sales," according to the company, its how-to content packages are linked to relevant, contextual e-commerce product offerings.

Demo will feature several groups



THE KODAK PALM PIX CAMERA, to be debuted at Demo 2000, immediately loads pictures directly to PalmPilot.

trying to secure a niche in the red-hot mobile computing and wireless markets, as well.

Digital Bridges Limited is introducing a Wireless Entertainment Server for mobile users who do not want to remain idle. Targeted at gamers bidding their time on WAP (Wireless Application Protocol)-enabled cellular phones and PDAs

(personal digital assistants), the Wirelessgames.com channel will offer multi-participant games specifically designed for handhelds from a number of major entertainment

companies, according to a source at the company. Rounding out the mobile offerings is Kodak, which will introduce an add-on module for all versions of its Palm Pix camera that will attach to any PalmPilot. The module stores files that can be saved and viewed on the Pilot screen.

Finally, Be Inc., the alternative operating system company, will be on

hand with Stinger, a prepackaged OS for mobile and stationary Internet appliances. The company will offer Internet appliance hardware manufacturers a complete OEM kit that will include the BeOS, an e-mail client, a Web browser, RealPlayer G2 video and audio, and a customizable user interface using a total of 8MB of flash storage.

Translation services

Sentius focuses on language

By Stephanie Sanborn

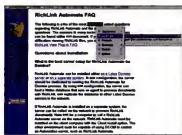
AT DEMO 2000, Sentius will demonstrate the next version of RichLink, its document enhancement technology. The hosted service embeds pop-up descriptions or translations of certain words, as well as audio or video links, into a document to increase its usefulness for international audiences.

Many English documents are unused outside of North America because they are not translated, and

foreign readers have a hard time decoding documents with unfamiliar industry terms, said Marc Bookman, president and CEO of Sentius.

"Overseas, people say, 'It's in English, I'm not going to read it now,' and end up never looking at [the paper], which turns into a kind of avoidance," Bookman said.

RichLink gives readers in other countries translations and definitions of unfamiliar English words in their own languages and can place



RICHLINK'S POP-UP windows give users word translations, definitions, and context.

the term in the correct context. The product does assume that readers of these business documents will have some prior knowledge of English.

Companies can use RichLink's

various databases, including collections of technical, health, and business terms, or create their own, company-specific databases. RichLink supports German, French, Japanese, Spanish, and English, with Chinese and several other European languages in the works.

Currently RichLink's service is enabled by a free plug-in, but Sentius will unveil a browser-based version at Demo, expected to ship in the fall of 2000.

Sentius Corp., in Palo Alto, Calif., is at www.sentius.com.

Demo 2000

Continued from page 1

e-mail using vocal commands.

David Leibowitz, solutions development manager for Nine West Group in White Plains, N.Y., a large wholesaler, retailer, and distributor of women's footwear and accessories, believes speech recognition tied to a wireless device will have a powerful business benefit. Nine West moved from faxing field reports to a mobile system using a Nokia 9000 handheld, which has a small keyboard.

"The 9000 is a great device, but if you could input the report with

your voice it would be meaningful. [We want] anything to free up the time," Leibowitz said.

Like Nine West, L&H officials envision many business solutions such as insurance company claims adjusters using speech, rather than keyboards, to fill out forms.

Another IT executive said voice recognition will expand the base of users at his company, adding that the Palm handheld's use of Graffiti handwriting-recognition may have held it back.

"If you didn't have to learn Graffiti, it would open up the market to a wide range of executives," said John Weaver, vice president of information technology at Electra Entertainment Group, in New York.

The StrongArm II was optimized to run the mobile version of Linux, said Bill DeStefanis, senior director of product management at L&L, and has the equivalent performance of a desktop Pentium III.

"The StrongArm II mimics high-performance desktop processing on a battery-powered, low-voltage device," DeStefanis said. "It has the additional horsepower and statistical math co-processing capability for robust support of a large-vocabulary speech engine," he added.

StrongArm 2 should ship in the second half of 2000, said an Intel representative, and will have 400- to 500-MHz performance at launch.

One analyst said Linux is a good choice as the handheld's OS, be-

cause it has a low power overhead.

"With Linux you get a lot more power and a better power consumption profile," said Nathan Brookwood, a senior analyst at Insight 64, in Saratoga, Calif.

L&H expects products based on Nukt to ship by the end of the year, and is seeking OEM partners. Pricing is not set but is expected to be in the \$200 to \$600 range.

L&H said it felt that Demo was the appropriate place to show the product, given the show's status as a high-technology version of show-and-tell for venture capitalists and IT executives. Demo is held annually in Indian Wells, Calif.

Lernout & Hauspie, in Burlington, Mass., is at www.lhs.com.

SHOWBRIEFS

DoDots delivers

DoDots Inc. is targeting companies that need to distribute Internet content to users' desktops. The company's namesake product breaks up content into smaller pieces called Dots and distributes them to desktops. Using Dots lets users connect to multiple sites concurrently, allowing them to track Internet content from several sources.

Koch gets legal

Former New York mayor Edward I. Koch will launch a new Web site through his start-up, Internet Ventures. The site — www.thelavplus.com — will offer free legal information, include live chats with lawyers, and present research on individual legal issues.

SFA site planned

Salesforce.com, a Web site chaired by longtime Oracle executive Marc Benioff and backed by Larry Ellison, is targeting companies that want to outsource their SFA (sales force automation). The site provides companies with access to browser-based SFA software, allowing them to access, manage, and share their vital sales-related information.

vShip looks abroad

vShip Corp. will show a system that facilitates international e-commerce by providing online merchants with complete payment processing for foreign orders. The system, called Custom Wire, is said to remove traditional barriers for consumers in the international marketplace, opening access to several relatively untapped foreign markets online.

Web radio boosted

Internet radio could get a boost from Kerbang's self-named Internet appliance, a stand-alone Internet radio that allows the user to listen to Web radio as easily as AM/FM radio, according to the company. Kerbang has also developed an online radio directory that is said to limit the search time required to find songs or stations on the Internet.



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IBM readies DB2 update

■ Big Blue plans database and content management wares

By Michael Lattig

IBM WILL TURN UP the heat on its database competitors once again this year with the launch of its next database engine and a series of products aimed at content management.

IBM will take an aggressive step toward its stated goals of providing heterogeneous data access and a broader analytic platform with the launch of its latest DB2 Universal Database, which officials are referring to as DB2 Version 7.

Currently in beta test version and expected to ship by the end of the second quarter, the new DB2 will see Big Blue drive its Data Joiner as well as the "heavy-duty analytics" from its Intelligent Miner product directly into the database engine.

The company will also integrate its Visual Warehouse more tightly into the database and provide a variety of extensions to allow native access to other data sources, such as Oracle and Sybase databases, according to Hershel Harris, a director of strategy and market management at IBM.

That goal, in addition to driving the features in DB2, will be reflected in a number of products IBM is

lining up for the spring.

These will include an OLAP (on-line analytical processing) Starter Kit, with a five-user DB2 license, OLAP Server, and Visual Warehouse products in one package, as well as Content Manager, which company officials say will emerge as both a product and a brand focused on building capabilities around the capture, management, and distribution of online content. IBM is also planning to offer a low-cost Web Content management package based on DB2 that will be aimed at ISPs.

In addition, IBM hinted at future technologies for such tasks as real-time sales forecasting and data sampling. One, dubbed Clever, tracks relationships between Web sites to determine which sites are most useful through a "Hub and Authority" paradigm.

IBM will also advance its enterprise information portal strategy throughout the coming year, implementing a rolling beta program that will result in a few product releases as well as constant updates.

According to Merv Adrian, vice president of research management at GIGA Information Group, in San

IBM plots data futures

The company is planning several analysis tools.

- Dedicated analysis server
- Advanced data transformation
- Added partitioning features
- In-memory database functions
- Self-managing and tuning capabilities

Jose, Calif., the focus on Data access and content management being demonstrated by IBM could be a good move in this highly competitive market that is quickly narrowing to a contest between IBM and Oracle on the high end.

The biggest potential loser in all of this, Adrian said, is Microsoft, which, despite the pending release of SQL Server 2000, still faces what he described as a "self-limiting ceiling."

"Microsoft's approach is still not of an enterprise bent; it is still not of developers for developers," Adrian said. "Given the distribution of platforms out there, it could be a long time before they can really be a tier-one player."

IBM Corp., in Armonk, N.Y., is at www.ibm.com.

Networking infrastructure

Novell to make Internet push

By Stephanie Sanborn

NOVELL THIS WEEK will reveal its "Net services" strategy, which comprises several business-to-business and 1-commerce products.

As part of this, a series of ZENworks announcements, centered around the release of ZENworks for Networks 1.0 and ZENworks for Servers products, will position ZENworks more as a product brand. Novell will also provide further details about its iChain e-business software.

ZENworks for Networks uses NDS to manage network traffic and store quality-of-service policies for bandwidth allocation and edge device configuration. The solution is made up of policy servers and traffic management agents hosted on servers within the network.

ZENworks for Networks will also be leveraged for Novell's implementation of the DEN (Directory-Enabled Network) standardization effort to automate device configuration management.

Novell picks a partner

Novell partnered with IBM to offer e-business solutions in Europe, with collaboration in several areas.

- Novell NetWare will be integrated with IBM Netfinity servers
- IBM's Caching Appliance will be integrated with Novell Internet Caching System
- IBM will train its Global Services staff as Novell Certified Directory Engineers in all major European countries

Novell will also target business-to-business e-commerce with its iChain platform, which sources called "the next step in the evolution of eDirectory."

The company will add security, authentication, and ease of management features to the eDirectory framework, allowing companies conducting business over the Internet to verify their partners' identities and provide appropriate access to shared resources. XML will link the directory and iChain platform.

iChain is not designed as an application, and existing e-business applications will hook into it and the directory to give e-business customers a complete solution extending from Novell's infrastructure, sources said. Novell is expected to partner with several e-business vendors to ensure their solutions will connect with iChain.

Other components of Novell's strategy include Novell Internet Messaging System, an Internet-based system that leverages NDS and supports LDAP (Lightweight Directory Access Protocol), POP (Post Office Protocol), and IMAP (Internet Messaging Access Protocol). This will be enhanced to make it more suitable for the business-to-business arena.

"I think that they're clearly right to be moving into this business-to-business software solutions area," said Dan Blum, senior vice president of The Burton Group, in Midvale, Utah. "It's an area where Microsoft has not been doing so well as they've been trying to get Windows 2000 out, and Novell needs to position itself strongly from the directory and security infrastructure standpoint."

Novell Inc., in Provo, Utah, is at www.novell.com.

Class-action suit

AOL faces \$8 billion lawsuit for software interference

By Brad Shewmaker

ISP GIANT America Online took a potentially damaging hit last week as it was handed a class-action lawsuit demanding at least \$8 billion in damages allegedly caused by its Internet software, AOL 5.0.

The lawsuit, filed in the U.S. District Court in Alexandria, Va., seeks \$1,000, or three times the amount of damage — whichever is greater — for each of the estimated 8 million people who have already downloaded the faulty software.

AOL will fight the lawsuit.

"[AOL 5.0] does not prevent members from accessing the Internet through other providers," said AOL spokesman Rick D'Amato. AOL has come under much criticism since releasing the software; users have complained of interference it causes with other programs, particularly other ISP's software.

The filing alleges that "Version 5.0 disables, interrupts, alters, or interferes with operations of other software installed on those same computers, including but not limited to disabling any other internet software which provides internet

access by non-AOL ISPs."

AOL software is used by many people as either a backup to their work dial-ups, or as a connector for them to use at home or on the road. The problem seems to be affecting people from all technological backgrounds, perplexing first-time users and veteran computer and Internet users alike.

"I ran into multiple problems not the least of which was the interference with my normal ISP," said Kevin Wohler, a disgruntled AOL user. "AOL made changes to my system that I would have never agreed to."

AOL claims the software does not make any changes to anything, including the settings, unless the user permits them. "They must choose AOL as their default Internet setting," D'Amato said.

In Cologne, Germany, a trad group called the eC Electronic Commerce Forum issued a warning against using the "crash-prone" AOL 5.0, citing reasons similar to those in the U.S. lawsuit.

America Online Inc., in Dulles, Va., is at www.aol.com.

Ford partners to equip workers

By Eugene Grygo

IN WHAT'S BEING described as an unusual partnership, Ford Motor has agreed to offer to its 370,000 salaried and unionized full-time employees worldwide Internet access via PCs and printers from Hewlett-Packard, as well as services from UNinet and PeoplePC for a nominal monthly fee of \$5.

Ford officials declined to put a dollar amount on the three-year agreement, which will allow employees to have three hardware upgrades at their expense.

Part of the attractiveness of the deal for the IT vendors involved, including HP, PeoplePC, and UNinet, will be the potential exposure to Ford's international staff roster, said Kathleen Vokes, public affairs manager at Ford. "This is not a standard vendor relationship."

According to the agreement, HP will provide Ford with its HP Pavilion PCs and Color Deskjet printers whereas PeoplePC will coordinate the project. UNinet will serve as the ISP. AMR Research estimates that Ford will pay more than \$200 mil-

lion over three years for the effort.

PeoplePC will also provide a new Web front end to a still-unnamed Ford portal, as well as the services and setup for employees, said Jim Yost, Ford's CIO. Ford's employees will access the portal via the Internet, and this effort will be separate from Ford's sales-force intranet.

Users will also be given two e-mail addresses that will allow Ford to have a free flow of information companywide as well as provide an opportunity for Ford employees to become computer and Internet literate, Yost said. "We have no interest in monitoring employees' e-mail or the capability to do that," Yost added. "The important part is connecting our people."

Loaded with Windows, the first offering of HP Pavilion PCs will have a 500-MHz Celeron CPU 64MB of RAM, a 4.3GB hard drive CD-ROM support, a 15-inch monitor, a speaker, and a modem.

The rollout will start in April and will be complete in about one year. Ford Motor Co., in Detroit, is at www.ford.com.

The Internet has changed the way business gets done. For example, there's a lot more talking about the Internet than business getting done.

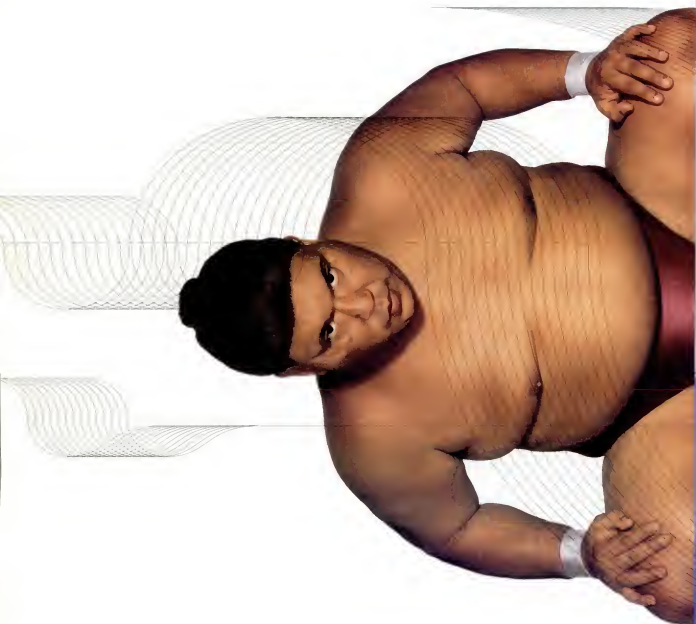
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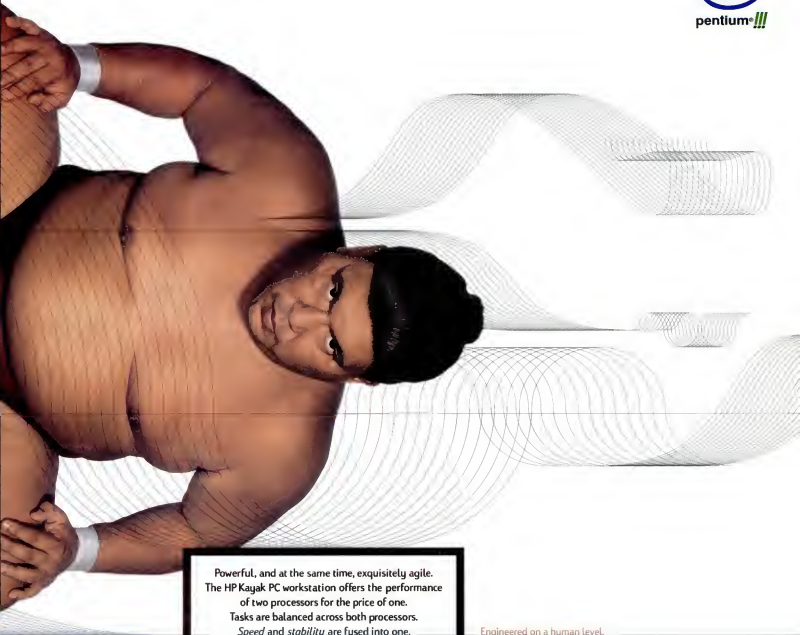
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Briefs fly in MS/DOJ case

Advocates for government and Microsoft weigh in

By James Nicolai

A POWERFUL software industry association that counts Microsoft among its members has urged the judge overseeing the U.S. government's antitrust case against Microsoft to find that the company has violated antitrust laws.

The Software and Information Industry Association (SIIA) made its recommendation in a "friend of the court brief" filed last week on behalf of the U.S. Department of Justice, which is pursuing the case against Microsoft along with 19 states.

The filing was one of a handful of such briefs that could help shape the opinion of U.S. District Court Judge Thomas Penfield Jackson as he hears a final ruling in the case. Other briefs were filed on behalf of Microsoft and the 19 states; another, penned by a Harvard law professor, Lawrence Lessig, was filed at Jackson's request.

The SIIA brief cited opinions expressed in Judge Jackson's findings of fact, a preliminary ruling issued last November in which the judge called Microsoft a monop-

oly that has harmed competition and consumers.

"A successful company such as Microsoft can lawfully obtain and retain a large market share, and can compete vigorously to the detriment of smaller rivals," the SIIA said in its brief. "The antitrust laws have established limits on permissible conduct by a company with monopoly power, however, and Microsoft has flagrantly exceeded those limits."

The SIIA, which voted by secret ballot Jan. 24 in favor of filing the brief, claims to be the world's largest trade association representing companies in the software, information, and Internet industries.



Hosted applications

Lawson building credibility in ASP arena

By Eugene Grygo

and Ted Smalley Bowen

WITH NUMEROUS customer and partner implementations in hand, Lawson Software is seeking to ride the front of the emerging ASP (application service provider) wave with its outsourced and hosted business software.

Lawson appears to be eyeing the midmarket for ERP (enterprise resource planning) applications; as a showcase in Boston last week, Lawson had on hand seven customers for its LawsonTone program, an application hosting service.

The group is using Lawson's applications via a number of ASP

partners.

Several of the new customers — who represent important vertical markets for Lawson — said they chose Lawson's offerings over those from vendors such as PeopleSoft and Oracle, according to David Boulanger, a research director at Boston-based AMR Research.

"Lawson may be going upstream in the midmarket," Boulanger said. The vendor may have found a way to move up by leveraging its ASP offering, he said.

Along with PeopleSoft and Oracle, Lawson may give new competition to J.D. Edwards and SAP. "They may be getting some trac-

tion," Boulanger said.

Heilig-Meyers first settled on Lawson's applications and then selected the ASP approach for implementation, according to Lee Pringle, IS director for financial and HR systems at Heilig-Meyers, in Richmond, Va.

"The choice was based on Lawson's feature set and capabilities. We felt that Lawson's security and that of the [IBM AS/400] platform were good enough to justify the ASP approach, and [hosting company] Cyber bent over backward to accommodate our needs. We're really in a partnership to manage the applications," Pringle said.

Microsoft is a member of the SIIA's elected 19-member board. Microsoft had a "full opportunity" to share its views on the matters discussed in the brief, the SIIA said in the filing.

The SIIA's filing came after another trade group, the Association for Competitive Technology (ACT), filed a brief on behalf of the Redmond, Wash., software giant and its Washington leader.

The Washington law firm of Wilmer, Cutler & Pickering authored the brief, which said trial evidence did not prove Microsoft had violated antitrust laws.

ACT's brief was signed by several legal and political luminaries, including Griffin Bell, who was attorney general during the Carter administration; former Johnson administration Attorney General Nicholas Katzenbach; and C. Boyden Gray, who was legal counsel during the Bush administration.

Also last week, Microsoft filed a rebuttal in Jackson's court addressing charges leveled last month by the Justice Department. As in its previous filings, Microsoft said no

infringement. "Time and again, [the] plaintiffs only support for bold pronouncements about applicable legal principles is a citation to their own proposed conclusions of law, which themselves contain little in the way of legal authority," Microsoft said in its rebuttal.

Microsoft Corp., in Redmond, Wash., is at www.microsoft.com. The SIIA is at www.siiainet.net. The U.S. Department of Justice is at www.usdoj.gov.

James Nicolai is a San Francisco-based senior correspondent for the *IDG News Service*, an InfoWorld affiliate. Additional reporting by Nancy Wenz and Margret Johnston, also of the *IDG News Service*.

Lawson's friends

Here are some of the 75 customers Lawson has signed for its ASP offering.

- Employee Leasing and Management
- Heilig-Meyers
- Missy's Candy Co.
- PharmaPlaza.com
- SCI Companies
- Reed Hospital
- Virtual Growth

At the Boston event, customers cited IT personnel savings, the ability to simplify business processes, and a relatively quick and inexpensive means of adopting Internet business models as key reasons for selecting the Lawson offerings.

Dutch cyber-pharmacy start-up PharmaPlaza.com, based in Amsterdam, chose the outsourcing

strategy as a way to ramp up its IT infrastructure quickly while leaving resources to be invested in delivery mechanisms and front-end systems, said CIO Evret Jan Hoijtink.

"We needed to get very quickly to the point where we can do business volumes on the scale of 150,000 orders and 25,000 returns. We chose to focus on our customers by using IT as an enabler, not the focus. We need quality IT systems, but setting up and maintaining such an environment is costly," Hoijtink said.

Lawson Tone offers two service options: Lawson Tone Application Hosting for businesses contracting directly with ASP partners; and Lawson Tone BPO (Business Process Outsourcing), in which Lawson acts as a consulting partner.

Lawson Software, in St. Paul, Minn., is at www.lawson.com.

Management vendors target e-commerce

By Brian Fonseca

AS THE E-COMMERCE market matures, tools for managing the e-commerce infrastructure are becoming increasingly important.

Hewlett-Packard's announcement of its HP OpenView VantagePoint IT management suite last week marks only the latest attempt to assist brick-and-mortar companies as they cautiously ease into the e-commerce world.

"This is an area that traditional [network and systems management] vendors haven't really focused on in the past," said Stephen Elliot, an analyst at the Gartner Group, in Lowell, Mass. "[But] in

any e-business, there are mission-critical networks and mission-critical Web applications. Performance and availability are the drivers."

Simultaneously with the announcement that HP is rebranding its OpenView IT/Operations product line as HP OpenView VantagePoint, the company announced enhancements including three modes of operation: Business-Driven Intelligence, Instant Intelligence, and Active Intelligence. The modes offer the creation of service maps and policy tools to automate the enterprise's services and a threshold-based response capability to address unexpected changes and

problems in the system.

In a similar vein, at ComNet 2000, NetScout released WebCast 3.1, a Web-based reporting tool providing Web-based "newspaper-style" reports of enterprise application and network performance.

Elliot predicted that in the near future, network management vendors may move toward a service-oriented MSP (Management Service Provider) model. MSPs would offer a back-end, hands-off approach for dot-com customers not interested in managing their own infrastructures.

"The enterprise has gotten extremely competitive. You have to be

Managing the Web

Vendors are planning tools for managing e-commerce installations.

- HP OpenView VantagePoint, which runs on Unix or Microsoft Windows platforms, will ship in April. Pricing is from \$20,000.
- NetScout's WebCast 3.1 is currently available and priced at \$4,995.
- BMC Software has released software as part of its OnSite Program for managing mainframe-based e-commerce infrastructures. Pricing starts at \$86,000.

a mega-vendor to have a good position in it, so everyone is looking at the service provider market as a good opportunity," Elliot said.

BMC Software is already leaning in that direction with its BMC Software OnSite program. The branding certification program gives Web site

operators using BMC's Patrol management products performance guarantees.

Daryl Stearn, director of systems infrastructure at online utility retailer Ashford.com, in Houston, said BMC's OnSite program monitors their company's Web site on Windows NT and Microsoft Internet Information Server both locally and from a remote location.

"We weren't really monitoring the Web site before except [with] a guy sitting at home and pushing the reset button from the browser," Stearn said.

Hewlett-Packard Co., in Palo Alto, Calif., is at www.hp.com. NetScout, in Westford, Mass., is at www.netscout.com. BMC Software, in Houston, is at www.bmc.com.

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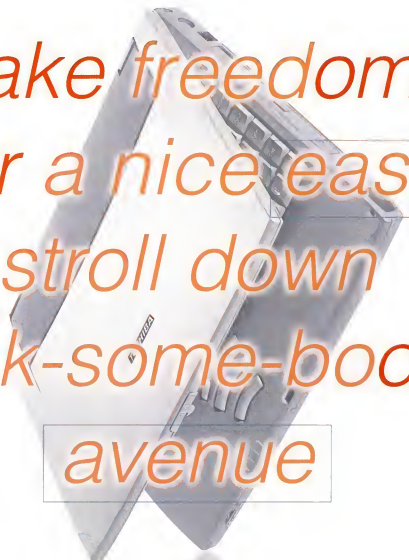
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BUSINESS BRIEFS

LEGISLATIVE MOVES

Bill for permanent Net tax ban to be proposed

House Policy Chairman Christopher Cox, R-Calif., and Senator Ron Wyden, D-Ore., are planning to introduce the Internet Non-Discrimination Act in an effort to make permanent the temporary moratorium on new Internet taxes.

The temporary moratorium was introduced in October 1998 by the duo, through the Cox-Wyden ITFA (Internet Tax Freedom Act). ITFA also created a national commission to examine how a tax system should apply to e-commerce and the Internet.

"The evidence is now in: Keeping discriminatory taxes off the Net is good for consumers, entrepreneurs, and the governments that tax them," Rep. Cox said in a statement.

E-COMMERCE

Vendors lobby EC over taxation

LEADING U.S. companies last week called on the European Commission to redesign the European Union's (EU) indirect tax system to eliminate the disadvantage faced by European e-commerce companies.

The EU's system is a 15 to 25 percent VAT (value-added tax) based on the value added at each stage in a manufacturing, service, or marketing chain.

In traditional commerce, the tax paid by companies is passed to the consumer, but for non-EU e-commerce companies selling to Europe the tax authorities have no record of the transaction, so the VAT goes unpaid.

This is a disadvantage for domestic EU companies, according to the American Chamber of Commerce,

which represents U.S. companies operating overseas.

The European Commission is drafting legislation to try and resolve the problem.

FINANCIALS

Sprint blames loss on wireless costs

CITING COSTS related to the rollout of its wireless network, Sprint last week reported a consolidated \$935 million loss for operating activities for the fiscal year that ended Dec. 31, 1999, compared to \$414 million in 1998. Fourth quarter per-share income from core operations, however, beat analysts' expectations.

The overall loss stems mainly from Sprint's rollout of its PCS (Personal Communications Services) network, said a spokesman.

Sprint also reported a consolidated Internet operating revenue of \$19.93 billion, a 19 percent increase

from the previous fiscal year.

Sprint did not release consolidated Internet income results for the fourth quarter of 1999, but that revenue for the quarter totaled \$5.32 billion, said the spokesman.

ANTITRUST ACTION

DOJ drops NSI antitrust case

THE U.S. DEPARTMENT OF Justice has closed its antitrust inquiry into Network Solutions' management of the Internet's primary DNS, the company said in a statement last week. No action is being taken.

The company was informed of the probe in June 1997 and was asked to supply information about its management of the DNS.

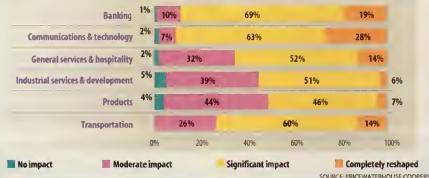
Network Solutions is a registrar of Internet addresses ending in .com, .net, .org, and .edu.

—Compiled by Matthew Woollocator

BY THE NUMBERS

CEOs acknowledge the Internet's impact on business

A majority of corporate leaders say e-commerce is having a big impact on industry competition, according to a global survey of 1,020 CEOs by PriceWaterhouse Coopers. Here's a breakdown of the top six industrial categories.



STREETPRICES

Multifunction printers

For the week of Feb. 7

Model*	dpi	ppm†	Low	High	Average	Change from October
Brother MFC-6650MC	600	6	\$513	\$615	\$560	+2%
Brother MFC-7150C	720	5	\$370	\$480	\$405	-2%
Canon MultiPass C5500	720	7	\$199	\$277	\$253	-5%
Canon MultiPass L6000	600	6	\$328	\$400	\$365	-3%
HP LaserJet 3100xi	600	6	\$566	\$739	\$641	-2%
HP OfficeJet 630	600	5	\$234	\$306	\$258	-17%
HP OfficeJet 880xi	600	11	\$670	\$800	\$710	+1%
HP OfficeJet T45xi	600	9	\$348	\$500	\$409	-15%
HP OfficeJet T65xi	600	11	\$430	\$569	\$480	-14%
Xerox WorkCentre 480C	1,200	8	\$303	\$500	\$344	-8%



All recent Street Prices listings are available at www.infoworld.com. Individual Street Prices are based on telephone surveys of retailers, online resources, and on print advertising in computer publications and regional newspapers. Price information was collected between Jan. 22 and Jan. 25.

1. All model numbers include a printer, fax, scanner, and copier. All models are color ink jet printers, except for the Brother MFC-4650MC, the Canon MultiPass L6000, and the HP LaserJet, which are monochrome laser printers.

2. Pages per minute.

Net infrastructure spending ramps up

Spending on e-business infrastructure was estimated at \$153 billion in 1999 and is expected to rise to nearly \$350 billion by 2003, according to a study by the Internet Research Group.

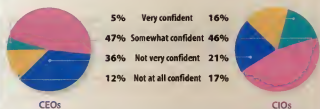


—Compiled by Jim Battey

Execs exude lack of confidence in technology

Only about 12 percent of Fortune-500 CEOs and CIOs are very confident that their companies have the communications technology needed for the next few years, according to a survey commissioned by networking company Unisphere Solutions. The study, which was conducted by Impulse Research, also revealed that 69 percent of the 200 executives interviewed said that the costs of new solutions often turned out to be greater than anticipated.

Does your company have all the communications technology solutions it needs for the next two to three years?



What's up
45%

Estimated increase in notebook PC display revenues from 1999 to 2000, according to DisplaySearch

What's down
-5%

Estimated decrease in notebook PC display prices from 1999 to 2000, according to DisplaySearch

What's down

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COMPAQ NonStop

Linux bandwagon filling fast

■ Show sees support and tools bolstered across the board

By Ed Scannell

NEW YORK — The growing strength of Linux in corporate America manifested itself at LinuxWorld Expo here last week, as several major vendors threw their weight behind the open-source operating system with new products and deeper strategic commitments.

Leading the parade was IBM, which pledged to deliver its Journaled File System and engineering support to the open-source community. IBM is also making its Via-Voice speech-recognition product and thin clients available on Linux.

IBM announced that the code for its Journaled File System — technology that is on all of its major operating system platforms — is now available for download from its IBM developerWorks Web site.

The journaling capability allows users to track their data more efficiently and to retrieve it in the event of a server failure, a valued necessity in operating e-business file servers.

IBM has made code and utilities available to the open-source community over the last year, including its XML parsers and Jikes reference compiler.

IBM's intensifying efforts around Linux reflect the company's bullish predictions about the platform's use in business.

"Linux is moving into the computing mainstream at least as fast as the Internet did earlier this decade and figures to fuel even further the growth of e-business," said Irving Wladawsky-Berger, newly appointed vice president of technology and strategy for IBM's Enterprise Systems Group.

IBM will also offer a Linux-compatible application developer's kit that includes DB2 Universal Database, WebSphere Application Server for Linux, Lotus Domino for Linux, and VisualAge for Java for Linux.

Furthermore, IBM will deliver what it contends is the first available speech-recognition product for Linux. The new product allows developers to voice-enable a range of Linux applications.

Finally, Big Blue last week said it will offer a beta version of Net-Objects TopPage, a Web authoring tool that allows nonprogrammers to create Web pages.

Also at the conference, Sun Microsystems gave Linux a triple shot of support when the company let go of key portions of the NFS (Network File System) protocol and its claims on the NFS trademark. Sun also doubled funding for Linux NFS, Version 4.

Specifically, Sun released its TIRPC (Transport Independent Remote Procedure Call) protocol under a new licensing program dubbed Sun Industry Standards Source License.

Under the new licensing program, developers will be able to change and disseminate source code freely. And vendors will be able to include the code in their products without having to make burdensome disclosures.

Unix stalwart The Santa Cruz Operation (SCO) jumped into the Linux market for the first time at the conference, announcing a Linux version of its Tarantella server product and Web-enabled server-side software.

The product allows IT shops to

deploy Linux, Unix, mainframe, and Windows NT applications in a thin-client environment without having to modify existing applications.

Corel announced it will deliver its WordPerfect Office 2000 for Linux in two versions, Standard and Deluxe. Both versions are compatible with the company's Windows version of WordPerfect Office 2000.

Also last week, members of the Trillian project, an effort among several major vendors to port Linux to Intel's upcoming IA-64 chip, touted the release of its code to the open-source community.

"This marks the first time that software can be developed by the entire open-source community for a preprocessor architecture," said Sri Chikiluru, director of the Trillian project, in Sunnyvale, Calif.

Not all the news at last week's show was upbeat. During his keynote address, Linux inventor Linus Torvalds said that the upcoming Version 2.4 of the Linux kernel was behind schedule.

Previously expected this quarter work on the kernel is now anticipated not to be complete until midyear, and is not likely to appear in distributions of the operating systems until sometime this summer, Torvalds said.

"We were on a nine- to 12-month schedule to deliver 2.4, but it will end up being more like 18 months since we delivered [Version] 2.2," Torvalds said.

Because the process is taking too long, Torvalds said developers are readying a "preview" version of 2.4 that would include some minor "tweaks and bug fixes."

Just a reminder
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— Honorio Padron,
Executive Vice President
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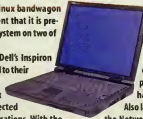
LINUX ON THE DESKTOP

Dell Computer climbed on the Linux bandwagon last week with an announcement that it is pre-installing the Linux operating system on two of its current laptop offerings.

Red Hat Linux 6.1 is available on Dell's Inspiron 7500 and Latitude CP1, at a price equal to their Microsoft Windows 98 counterparts.

Dell already offered Red Hat Linux as an alternative to Windows on selected workstation and desktop PC configurations. With the availability of Linux on its laptops, Dell is leading the pack in the deployment of Linux, according to Tim Scannell, an analyst at Mobile Insights, in Mountain View, Calif.

"Most major laptop manufacturers have a Linux program in place, and I expect that soon after [the Dell release], all these others will follow," Scannell said. Many laptops come with proprietary hardware that, according to Dell officials, makes Linux difficult to support. For example, IBM recently experienced problems with the



Windows-only modem of its ThinkPad laptops because the modem is installed on the motherboard.

"That didn't give us a problem [because] we've always used PC Card modems, as many of our customers — mainly corporations who prefer to stick with one software image — like having a choice," a Dell representative said.

Also last week, IBM touted two thin-client systems, the Network Station Series 2200 and 2800, which complement its ThinkPad, PC 300, and IntelliStation offerings. Big Blue will aim to make an iKc network installation easier when, in the second half of 2000, it delivers a version of the Network Station that has the client software loaded into cache memory so end-users can boot systems locally.

Dell Computer Corp., in Round Rock, Texas, is at www.dell.com. Red Hat Inc., in Durham, N.C., is at www.redhat.com. IBM Corp., in Armonk, N.Y., is at www.ibm.com.

— Dan Neal

Caching, content delivery evolve

By Stephanie Sanborn

WITH INTERNET users clamoring for faster Web site performance, the benefits of caching and content delivery are becoming more attractive to service providers and enterprises that realize a slow online response means fewer customers.

To hasten this trend, caching and content delivery providers such as Network Appliance, Novell, Inktomi, and Akamai are working on features such as personalization, streaming media support, and support for dynamic content.

Caching technology speeds up site performance, frees up bandwidth, and lowers connection costs by storing often-requested objects in a cache at the edge of the network, reducing network traffic.

"The fact is, it takes good caching to have good performance, and good performance is what it takes to keep people coming back," said George Peabody, managing director of telecommunications research at the Aberdeen Group, in Boston. "We're still going to need caching in the broadband network, because every time there's more bandwidth available we figure out a richer way to use it and fill it up."

Network Appliance, which recently released the NetCache 4.1 Streaming Media appliance, plans to help network service providers deliver services, including content filtering and virus scanning, via the NetCache appliance.

Novell is also working on multi-media caching for Novell Internet Caching System (ICS) devices and expects to add personalization features to specialize content based on device and user profiles or information stored in a directory, turning ICS into a full-service platform.

The next iteration of ICS will have an open API framework, giving developers and users access to

Basic Web caching

Web caching can help improve Web site response time and keep bandwidth requirements low by decreasing the number of hits made to the origin server.



- 1 Client request objects
- 2 Caching device gets objects from origin web server
- 3 Caching device saves (caches) objects for later use and sends copies to client
- 4 During subsequent requests for the same objects—from the original client or a different client—the caching device sends the objects from its cache instead of returning to the Web server

"In the flow" content service.

"Because you're at the application layer, you can actually identify what that application is—FTP or streaming audio, for example—and you can get within the application and do specific things to it" such as filtering content based on URLs or which media streams people may access, said Patrick Harr, director of product management at Novell.

Inktomi will also add services such as content access reporting at the edge of the network for service providers.

"In the ISP space, [what's big] really is the notion of value-added services," said Ed Haslam, Inktomi's director of product management. "Right now, people are laying basic foundations. Content really is just the first stepping-stone."

Inktomi will continue to target enterprise companies, a field Haslam called a "huge opportunity, potentially larger than the ISP space." Haslam also expects to see the storage of digital goods and transaction executions take place at the network edge in the future.

Content delivery is also making a splash, as companies realize the benefits of using a network of

servers to distribute Web content to the network edge and out to users. The service often goes hand-in-hand with caching, analysts said.

"I think that over time, lots more of the function of the Web site will migrate out to the edges—and cache just happens to be the first step on that pathway," said Peter Christy, vice president of the Internet Research Group, in Los Altos, Calif.

Rob Carney, vice president of Adero, a content management company, agreed.

"A big portion of our business is turning caching into a service, making it a little more intelligent, a little more directed, but essentially ... putting the control of caching into the hands of the content provider," said Carney.

Adero adds a second layer of intelligent routing to caching services and "distributed mirroring" capabilities so a content publisher can push content out to Adero's network at their own chosen intervals. Carney said Adero is working on moving more "dynamically generated content" and commerce applications to the edge.

Akamai is planning to deliver applications over its network, leveraging its FreeFlow content delivery service and EdgeAdvantage platform, which lets third parties plug into Akamai's network to offer value-added services, said Kieran Taylor, senior product manager at Akamai. Akamai will not create or host the applications, however.

A beta version of the application delivery service is expected in the first half of 2000, with general release during the latter half.

Network Appliance Inc., in Sunnyvale, Calif., is at www.netapp.com. Novell Inc., in Provo, Utah, is at www.novell.com. Inktomi Corp., in Foster City, Calif., is at www.inktomi.com. Akamai Technologies Inc., in Cambridge, Mass., is at www.akamai.com. Adero Inc., in Boston, is at www.adero.com.

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CACHING ALTERNATIVE OFFERED

Digital Fountain is touting a way to avoid the hassle of maintaining large server or cache farms in order to ensure fast Web performance, by using a combination of math algorithms and IP multicasting.

"Our strength is when there's concurrency—many people fetching the same object—that's where the power of multicast comes in," said Cliff Meltzer, president and CEO of start-up Digital Fountain.

Digital Fountain breaks information into packets and sends them over the network. Because of this packet-type delivery, users can turn off their com-

puters or disconnect from the Internet, and, once reconnected, can resume downloading, Meltzer added.

"For very popular stuff or very large objects where there's concurrency, this is a better delivery system [than caching] because latency is improved as the system gets busier," Meltzer said.

Meltzer said the company is also looking at video and audio content delivery as well as software downloads as potential new applications for its technology.

Digital Fountain, in San Francisco, is at www.dfountain.com.

—Stephanie Sanborn

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Paul Song, founder and CEO of ARIS Corporation, reflects on values and challenges of managing a rapidly growing high tech company. (pp.4-8)



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FROM THE EDITOR IN CHIEF · MICHAEL VIZARD

The Win2000 decision: Upgrading to the OS is a philosophical and an economic conundrum

WHEN IT COMES to operating systems, IT organizations traditionally have been a conservative bunch. After all, history has shown that it takes months, sometimes years, before an operating system becomes stable enough — usually after its second major update — to deploy in a production environment.

This month IT will witness the release of the mother of all operating systems in terms of size with the formal unveiling of Windows 2000, and the question that will be uppermost in the minds of most IT executives will be when they should deploy this release.

You'll note that the primary question is when, not if. Although many folks are evalu-

ating Linux or have some level of commitment to Unix in their data centers, the fact is that just about every organization is running some variant of Windows. And the other inescapable truth is that it's costing those organizations a lot of money to do so.

On the server side, the experiences that people have had with Windows NT have varied wildly. The sad truth is that Windows NT is an overly complex piece of software that requires people to have extensive knowledge in tuning applications to get the most out of the platform. Acquiring that level of NT knowledge is expensive. Failing that, the reliability of the platform, particularly third-party drivers for Windows NT apps, makes it necessary to throw a lot of additional hardware at server applications to make sure they are fault-tolerant. Again, this is an expensive way to run a server application.

When you do the numbers, most IT organizations running Windows NT today are between a rock and hard place when it comes to deploying Windows 2000. You can either leap now in the hopes of lowering the soft costs associated with the platform, not to mention the personal time you might regain by not having to reboot the operating system once a day. Or

you can continue to run Windows NT under the assumption that the devil you know is better than the one you don't.

On the client side of the equation, the issues are not as pressing, but even a cursory analysis of the financial costs associated with running Windows 9x environments would suggest moving to Windows 2000 as soon as reasonably possible is probably a good idea. However, trying to roll out Windows 2000 or any other operating system on top of an existing platform will be more trouble than it's worth. So although Win9x isn't a lot of fun to support everyday, the reality is you are going to be stuck with it until you can buy enough new Pentium III-class hardware to support it.

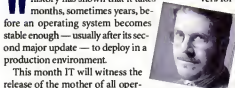
IT budgets being what they are means most companies won't be running Windows 2000 before next year at the earliest, no matter how good the operating system is. Of course, once you decide that you will make a change, you then have to decide if you are going to continue on a traditional thick-client approach, or if the time has come to adopt a thin-client computing model using Windows Terminal Server or some other similar tool.

The metric that will drive that decision most is philosophy. If you believe that client-side processing is a fundamental component of any distributed computing architecture

worth its salt, then you need to deploy Windows 2000 on a thick Terminal III client. But if you think that the advent of the Web means that centralized computing has returned with a vengeance, then you may want to look at terminal server applications. For its part, Microsoft's only offering Windows Terminal Servers as a concession to customers. It firmly believes that distributed computing requires robust clients.

In theory, the company could be right. But Microsoft could also be wrong. This is one of the great unknowns about the future of the Web. If you talk to the folks at Sun, IBM, and Oracle, they'll say Microsoft is losing touch with reality. If you talk to Microsoft, you'll hear that the Web will ultimately fulfill the longtime promise of real peer-to-peer distributed computing by creating a broad array of remote services that can be elegantly integrated into any application. I doubt that centralized computing precludes the development of similar services, but obviously the races are on, and Windows 2000, rather than being an end in itself, is now only a way station on the road to intelligent network computing.

Got another point of view? Write to me at michael_vizard@infoworld.com. Michael Vizard is editor in chief at InfoWorld.



E-BUSINESS TREND WATCH

Web 'bots' enhance self-serve experience

By Ephraim Schwartz

WHETHER you want to optimize your investments in petrochemicals or save \$1.50 on a best seller, you'll probably soon be doing it with a bot.

Short for robot, "bots" — also called autonomous agents — are small pieces of code sent out like carrier pigeons across cyberspace to bring back information, such as the best price on a product. Sometimes they go no further than the corporate knowledge base, where they are used as the first response to a help desk or call center request before the call is escalated to a live agent. By automating often time-consuming tasks, e-businesses can improve customer service by giving more consumers what they need much faster than with human intervention.

Bot builder Daniel Sapir, the COO of Boston-based Artificial Life, knows all about how companies can save money while improving CRM (customer relationship management) via bots.

"It's [a] tremendous cost reduction for CRM," Sapir says. Sapir quotes Forrester Research statistics that say a typical customer call handled by a live agent costs about \$33. The same call handled in a chat room environment is \$7.80. But if a bot can



ARTIFICIAL LIFE'S COO, Daniel Sapir, is expanding bot functionality via natural language recognition.

find the answer from the company knowledge base and automatically deliver it to the caller on-screen, the cost is \$1.17.

"Once you build your knowledge base, bots automate the process, and it is always there for the customer," Sapir says.

Shopping bot Web site mySimon.com is a typical example of the most popular implementation of bot technology on the Web: getting the lowest price. At its deepest level, a shopping bot is a piece

of software that mimics human behavior, according to John McDowell, vice president of engineering at mySimon Inc., in Palo Alto, Calif.

"To get 'smart,'" mySimon.com uses Simon Product Intelligent (SPI) agents, who are real people, to shop online at thousands of e-tailer sites. The SPIs are equipped with a tool called the virtual-learning-agent system, which mimics the shopper's behavior. The result: If a shopper is looking for a sweater, for example, the system will bring back results from a half dozen or so sites that will include not only price but also shipping information, color, and size — all the typical pieces of information a user would have been looking for.

But others are stretching the potential of bots with enhancements to the searching function: Sapir's company uses bots with natural language comprehension technology to carry on a limited but functional conversation between a customer and the bot, represented on-screen as a character, or avatar, as it is referred to in the industry. Liechtenstein Global Trust uses bot technology from Artificial Life for its "high net worth" customers, Sapir says. The financial services company, in Liechtenstein, uses the bot to go to predetermined financial Web sites such as those of the *Morning Star* and The

Wall Street Journal, scan data on user-determined criteria, and not only come back with information but also suggest possible actions based on the information.

"For example, if the interest rates are going up, it may be it is time to buy bonds and sell stocks," says Sapir, who adds that the bots are "trained" to spot trends.

Net-tissimo.com, a lifestyle Web site in Egerkingen, Switzerland, launching in the United States, sells wines, electronics, and computer peripherals and also provides travel information. It uses Artificial Life bot technology for its virtual butler that, if asked, can tell a visitor what to eat with a Merlot wine, for example.

"We started by offering information about the products. Then we collected information from our log files to see which questions were too complex for the butler to answer," says Roland Berger, CEO of Net-tissimo.com.

"The butler learns. He doesn't give canned answers. He picks and chooses words and puts them together into a [coherent] sentence," Berger says.

According to Berger, the look-to-buy ratio on the Net-tissimo site has gone from an average of 2 percent to 4 percent pre-bot to 10 percent sales rate post-bot. Looking ahead, bots will automate mundane tasks to complex searches.

"In order for an economy to be productive, it has to be automated, or it will remain primitive," Sapir says. "The promise and potential of the Internet is huge, but unless you begin automating things, it will never fulfill its promise."

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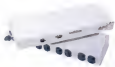


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Broadband

Continued from page 1

working feverishly to ready both the spectrum and the public for the debut of MMDS service, and MCI WorldCom next month will offer details on the service, specifying areas where it is being offered on a trial basis.

MMDS originated as a wireless cable television frequency, but remained largely unused until the Federal Communications Commission released digital MMDS frequencies in the 2.1- and 2.5 to 2.7-GHz ranges. Using these, Sprint and MCI WorldCom intend to provide high-bandwidth data, Internet access, and audio and video services to homes and businesses across the country.

MCI WorldCom CEO Bernard Ebbers recently commented on his company's commitment to MMDS, which is central to his scheme of bypassing local phone companies.

"MMDS will allow the new [MCI] WorldCom service to [reach] customers who are beyond the reach of traditional DSL — often in rural and small-town areas," Ebbers said.

Included in that MMDS vision are significant plans to target the

enterprise market, in particular those companies trying to re-remote workers into the corporate network, according to officials.

Although Sprint and MCI WorldCom also have DSL and cable strategies, they are the dominant MMDS force, said John Zahurancnik, vice president of broadband research at the Strategis Group, in Washington.

"They have bought up all of the big players and are in the neighborhood of owning about 70 percent of the market," Zahurancnik said. "Until last year, this was a fragmented industry with a lot of small players. Now the spectrum is in the hands of companies that are very well-financed to invest in services such as Internet, data, and even voice."

Upon clearing some immediate technical hurdles, company officials are banking that MMDS will have a much cheaper build-out than the extensive retrofits associated with other broadband options such as DSL and cable.

Bill Feidt, program director at MCI WorldCom Wireless Solutions, said the company is looking to spend about \$200,000 per square mile to put its infrastructure in place. This infrastructure would likely include radio transmitters af-

fixed to the tallest point in a geographic location.

But this cost is based on the assumption that the technical hurdles can be overcome cheaply. First, company executives must look through technical options to complete the transition of the spectrum — originally 33 analog video channels, each 6 MHz wide — to a two-way data medium. MCI WorldCom in the next few weeks will also begin working with the FCC to bring two-way data to the spectrum portions it will use. Only a small portion of the MMDS spectrum right now is licensed for two-way data.

"We are evaluating vendors and equipment ... and working with the vendors on platforms," Feidt said. Although he is still weighing options, Feidt said the company is aiming for access speeds in the 256Kb to 1.5Mbps range.

Aware of the potential market for MMDS equipment, networking hardware vendors are working to overcome the technology's limitations. Among these are the fact that in MMDS, the signal propagates well but faces the problem of multipath interference, or the signal bouncing off objects in the environment. That multipath interference can current technologies cause them either to degrade significant-

ly or just not work.

Cisco Systems, however, is developing MMDS equipment aimed at minimizing interference. Specifically, it is enhancing its VOFDM (Vector Orthogonal Frequency Division Multiplexing) technology, which delivers two-way data, voice, and video communications over the air at high speeds.

VOFDM's key asset is that it overcomes line of sight, distance reach, subscriber coverage, and antenna size problems with existing wireless systems. So it enables wireless communication in congested cities and rural and suburban environments.

"We plan to ship in the first half of the fiscal year point-to-multipoint, multiservice VOFDM solutions. It is a shared bandwidth solution, the way cable is," said Steve Smith, director of marketing for broadband fixed wireless at Cisco, in San Jose, Calif.

Cisco rolled out its first VOFDM product in November — the Cisco Wt2700, a wireless WAN interface for its uBR246 and uBR7223 universal broadband routers.

Last week, the company also announced that Nucentrix Broadband Networks is its first service provider customer for the VOFDM product. A field trial of broadband Internet access using the technol-

MMDS at a glance

The FCC began allocating the MMDS band in the 1960s.

• Some educational and religious groups use the band for television programming and cameras may have to make arrangements to move them to another medium

• The spectrum provides for cross-directional transmission from a central antenna and can be utilized in any necessary

• In certain terrains, MMDS cells can cover a 35-mile radius but require a line of sight to complete transmission

• MMDS can use 64 quadrature amplitude modulation for its downstream links for a raw capacity of about 10Gbps of bandwidth

• The signal is less vulnerable to weather interferences than Local Multi-point Distribution Service

SOURCE: STRATEGIS BROADBAND WIRELESS GROUP

ogy will begin in April.

"VOFDM solves some of the problems in the MMDS [spectrum] with shadowing, hitting foliage, and requiring line of sight. Cisco is going to use their [VOFDM] technology to improve their equipment, but they want to make VOFDM the standard for infrastructure equipment" in the MMDS spectrum, said Christopher Whitey, project manager at Insight Research, in Parsippany, N.J.

MMDS ALTERNATIVE TOUTED

Although use of most portions of the radio spectrum requires a license, there are exceptions — and renegade vendors who have built products and services for use in one of these unlicensed portions are attracting some big-name users.

The Unlicensed National Information Infrastructure (U-NII) had 300-MHz of spectrum set aside by the Federal Communications Commission (FCC) three years ago, mostly for wireless LAN products.

Vendors such as Fusion Communications and Western Multiplex have staked a claim to portions of U-NII and have developed products that take advantage of it.

Fusion makes a point-to-multipoint wireless network, which it says is now used by several enterprise customers to link together buildings situated on a campus.

Unlike MMDS — or Multi-channel Multi-point Distribution Service, (see related story, above) — and other parts of the licensed spectrum, U-NII solutions are geared mostly toward the corporate market, said John Wind, vice president of marketing and business development at Fusion, in Boca Raton, Fla.

"There are pros and cons to both. In the U-NII band, you don't have to pay the exorbitant licensing fees,"

Wind commented.

The downside is that the spectrum is not policed by the FCC, but is only safeguarded with "rights of non-interferer or squatters' rights," Wind added.

Fusion counts among some of its largest customers AutoNation and IBM's Southeast Federal Credit Union. The credit union uses Fusion's broadband solution recently instead of standard T1s to consolidate office locations and install communications into a new building.

Meanwhile, Western Multiplex in Sunnyvale, Calif., recently debuted a license-free fixed wireless link dubbed Lynx DS-3, which operates at DS-3, or 45Mbps rates. Enterprises as well as carriers such as AT&T Wireless are interested in using the Lynx products to extend the reach of their networks, company officials said.

Networking vendors such as Cisco Systems claim activity in the unlicensed spectrum market. However, their development work trails that in MMDS and other licensed frequencies. But Cisco is pitching products such as its Vector Orthogonal Frequency Division Multiplexing (VOFDM) line to U-NII vendors, said Steve Smith, Cisco's director of marketing for broadband fixed wireless.

— Jennifer Jones and Cathleen Moore

Platforms

Continued from page 1

encompassing platform. If effective, this services approach could save customers money on IT resources and speed development time, proponents say.

Microsoft's Next Generation Windows, a project that will bring Chairman and Chief Software Architect Bill Gates closer to the development fold, will introduce a design that will let customers pay for services such as voice over IP on the Internet, according to company officials.

"We want to infuse into our [operating] system services the way we infused Internet technology," said Jim Alkchin, group vice president of Microsoft's platforms group. As an example, Alkchin suggested a service where auction and banking sites could each deploy schemes necessary to allow for programmatic decisions to be made "easily on the client."

"When an auction item hits a certain price you could transfer money from your bank account over into the auction automatically," Alkchin said. "You could do that regardless of whether it's client or server. You could programmatically set this up as a set of rules."

Microsoft will further detail its Next Generation Windows initiative at Forum 2000 in April.

A source familiar with Microsoft's plan said that this Windows upgrade will not see the light of day for three years. The more modular version will be rewritten "almost from scratch, right down to the kernel," opening the door for incompatibilities with existing Microsoft operating systems, the source said.

At your service

Platform vendors are eyeing more of a services orientation but taking different approaches.

► Microsoft's Next Generation Windows Services will offer services over the Internet on top of its OS

► IBM is rewriting its middleware and renting it to ASPs so they can rent applications built on the middleware

► Sun's Jini program envisions a modular OS where services are delivered to devices over the network via Jini

"Basically, Bill [Gates] has finally come to the realization that the desktop is no longer the center of the universe, that there are other systems out there. So in order to effectively compete in the future, they're going to need something more server-based," said Anne Thomas, an analyst at the Patricia Seybold Group, in Boston.

Meanwhile, IBM is reworking its

middleware products so that ISPs, ASPs, and ISVs can offer their applications in a rented model.

Part of its Next Generation initiative, the next full-point release of IBM's core middleware products — including DB2 and MQSeries — will be revamped with Internet application services in mind, said Richard Sullivan, vice president of Integrated Solution marketing for IBM's software solutions division. IBM is also developing a rental model for these middleware products for ASPs that don't want to buy these software components, he added.

Middleware products designed and branded for application hosting will be released starting in the next six months, Sullivan said. "Most of the application industry will have to redo their applications for rentable applications," Sullivan said. "The direction the industry is moving is a core operating system and rentable services on top of it."

Sun will focus on Jini and Java as the keys to delivering services.

"Operating systems as we know and love them, as a large platform, [are] going to be supplanted, probably by much more narrowly focused operating system layers that will support services architecture, where the code will be delivered to a device or machine," said Richard Gabriel, a distinguished engineer at Sun.

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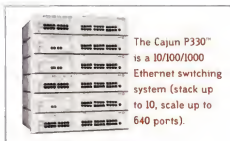


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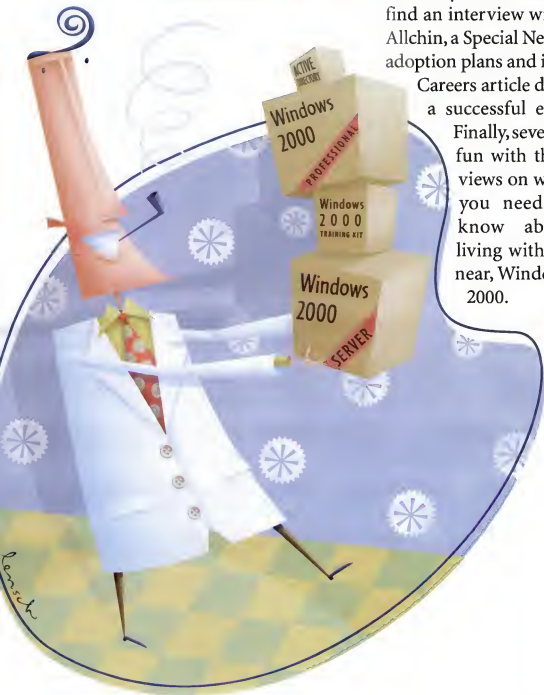
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Making the move

Whether you move to Windows 2000 this year, next year, or never, *InfoWorld* has an extensive lineup of articles to help you understand and prepare for the latest operating system from Microsoft. The Test Center offers reviews of the new products as well as Action Plans for upgrading to Windows 2000 and for preparing your existing applications to run smoothly. There's also an analysis of COM+. You'll find an interview with Microsoft executive, Jim Allchin, a Special News Report on Windows 2000 adoption plans and implementation issues, and a Careers article describing the components of a successful end-user training program.

Finally, several of our columnists join the fun with their views on what you need to know about living with, or near, Windows 2000.



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Test Center Action Plan

Performing the perfect migration

Thorough planning, attention to detail can lower costs of expensive upgrade

by Kevin Railback,
InfoWorld Test Center

MAKING THE MOVE from Windows NT or NetWare to Windows 2000 is not a job to be taken lightly. You must weigh factors beyond the time and money necessary to perform the migration. Training costs for IT staff and employees plus the much more advanced hardware requirements of Windows 2000 can make the upgrade much more expensive than it first appears.

Despite the initial expenses, Win2000—a platform more stable than NT—promises to lower total ownership costs through reduced administration and decreased overtime for servers and client machines. This, plus knowing that most application and server software will eventually require Win2000, should help you decide if the time is right to upgrade.

Also consider Win2000's Active Directory (AD), which can significantly reduce overall administration costs by centralizing directory information. By setting up AD as your company's primary directory service, you can greatly reduce the administration costs for client and server machines.

To lead the migration of Win2000 from NT 4.0, you'll need to do your homework first. Learn the steps

necessary for deploying Windows 2000 Server and Advanced Server as well as the process of migrating to Windows 2000 Professional.

SERVER MIGRATION

Phase 1: Research

The first step in deploying any system as large as Win2000 is research. If you don't know what's in your enterprise and what Win2000 features you want to implement, the project is sure to fail.

Your IT staff must take an up-to-date, detailed inventory of all the server and client hardware in the enterprise. This should include diagrams of network layout, router configurations, and firewall settings, as well as the protocols in use on your network.

The safest way to deploy Win2000 is to get it working before adding the bells and whistles. So another research goal is deciding which features from the new OS your business needs implemented off the bat. Postpone nonmission-critical functionality until after the initial migration, limiting the variables you'll need to check in case of a problem. Waiting until Win2000 is deployed before adding the extras can dramatically cut down on server and client problem debugging.



ver and client problem debugging.

Phase 2: Planning

The first step in planning your migration is to determine a time line. As your research and planning progresses, it should be updated to include reasonable milestones and goals. Dragging out the migration can drive costs way up.

All hardware and software should be checked for Win2000 compatibility, and upgrade options should be explored for non-Win2000-compliant packages. Fortunately, you can keep Windows NT 4.0 servers running for the software that hasn't been tested or approved for use with Windows 2000.

Also, IT staff and end-users may need training on Windows 2000's new features. In-depth training for system administrators can be expensive, but it will end up saving money in the long run when problems are avoided or resolved quickly.

Phase 3: Prerequisites

As soon as the first two steps are under your belt, and your IT staff is up to snuff on administering a Win2000 environment, proceed with preparing your infrastructure. Upgrade RAM in servers and clients as needed. Microsoft recommends a minimum of 128MB of RAM for servers and 64MB for desktops, but these numbers should be doubled for op-

timal performance.

All software updates must be performed to bring applications up to Win2000 compliance. Plan to maintain an NT 4.0 server to keep any non-Win2000-compliant software running.

Next, apply the latest service packs to your Win2000 servers. This way, you know you have the most stable environment possible in which to perform the migration.

Finally, reorganize your existing domain structure to make the transition to AD smooth. Enlist the aid of third-party tools, such as FastLane DM/Manager (see review, page 40), to automate the optimization of your domain structure. After migrating to AD, these tools will help with the testing and diagnostics.

Phase 4: Test migration

Now test your upgrade plan. Go through the migration process on a nonproduction server and take detailed notes. Record any problems or oddities you encounter so that you can address them before the real migration.

When you are confident that your plan will lead to success, create a detailed checklist from your notes. In the heat of the real server migration, it is easy to make mistakes or skip an important task.

Now, test all applications and services on the Win2000 server. Now is the time to squash bugs, before irate users find them for you. This includes testing e-mail server software, Web and FTP servers, CRM (customer relationship management) and ERP (enterprise resource planning) packages, and administration tools. Check network management suites to ensure that they still communicate with the Win2000 server, and monitor everything for stability.

Also, you must thoroughly check your new AD installation and all security settings and file permissions. Make sure that users can log in to the directory tree and access their

drives and applications. Try accessing administrator-only directories and applications from a user account without administrator privileges. If it looks good, you're ready for the next phase.

Phase 5: Server migration

If everything is working smoothly so far, begin the server migration. First, back up every server that will be affected. Verify these backups and store them in a safe place. If catastrophe strikes, getting the servers back up quickly will be of the utmost importance.

If you've prepared properly and tested everything thoroughly, the actual migration will be a breeze. Follow your checklist step by step—now is not the time to make any last-minute changes to your plan.

As you go through the installation and configuration of Win2000, document everything. If you run into problems, such as servers that cannot communicate or an e-mail server that doesn't work, this information can ensure a quick resolution later.

When the upgrade process is complete on each server, a set of

► **MIGRATION** page 36

WINDOWS 2000
MIGRATION
STEP-BY-STEP

- 1 Determine the infrastructure in your enterprise. Decide which Windows 2000 features you will deploy.
- 2 Check compatibility with existing hardware and software. Also begin training IT staff on new Win2000 technology.
- 3 Perform necessary hardware and software upgrades, apply service packs to all servers, and prepare domain structure.
- 4 Test your migration plan, build a detailed checklist of steps, and test servers and applications.
- 5 Take the plunge: Perform the actual migration of your servers.
- 6 Retest all aspects of your Win2000 deployment. Let a small set of users try the new system and if everything goes smoothly, perform the companywide rollout.

Will high deployment costs hinder migrations?

According to an October 1999 Gartner Group study, migrating servers and desktop PCs to the Windows 2000 platform will be a very expensive affair. Estimated migration costs could force companies to delay upgrading to Win2000.

SERVERS

NetWare 5x to Windows 2000 Server	\$457 per user
NetWare 4.x to Windows 2000 Server	\$430 per user
Windows NT 4.0 to Windows 2000 Server	\$279 per user

DESKTOPS

Windows 9x to Windows 2000 Professional	\$2,015 to \$3,191 per desktop
Windows NT 4.0 Workstation to Windows 2000 Professional	\$1,268 to \$2,044 per desktop

TYPICAL SCENARIOS (Using server's low-reaction for desktop migration)

1 Windows NT 4.0 server (200 users) to Windows 2000 Server	\$55,800
50 Windows 98 users to Windows 2000 Professional	\$100,750
150 Windows NT 4.0 Workstations users to Windows 2000 Professional	\$190,200
Total migration cost	\$346,750

2 Novell 4.11 servers (250 users total)	\$107,500
1 Windows NT 4.0 server (250 users total) to Windows 2000 Server	\$69,750
500 Windows NT 4.0 users to Windows 2000 Professional	\$634,000
Total migration cost	\$811,250

Migration

Continued from page 35

wizards will assist in the proper configuration of the new environment, including building your AD structure.

When you next log in, you'll be presented with the Win2000 Configure Your Server wizard. This program centralizes all of the tools and tasks needed to finish the upgrade. You can configure the server for various tasks, such as setting up Web services, an application server, file and print sharing, and AD.

Phase 6: Post-migration testing

You're not through the woods yet — now you must test everything again. Ensure that servers can talk to each other and all clients can log

critical in realizing all of the benefits Professional can provide.

Similar to the server migration, check for hardware and software compatibility with your existing infrastructure. Most in-place Windows applications should run fine on Win2000, but performance issues should be addressed.

Windows 2000 Professional requires 64MB of RAM, but this should be viewed as an absolute minimum. Any machines with less than 96MB will be noticeably sluggish. The most important factor to consider when planning this migration on your desktops is whether or not they will run well under the new OS. If you have mostly Pentium and low-end Pentium II machines with 64MB of RAM, expect to update them to at least 96MB or 128MB, if possible.

Compatibility with existing applications is also a critical factor to consider for client PCs. Before upgrading to the new OS, all software that your users need should be thoroughly tested on Windows 2000 Professional.

Additional resources

Don't hesitate to enlist additional aid with your Win2000 migration. The Windows 2000 Server Resource Kit will help in the planning and research phases of your deployment, and the Windows 2000 Server Deployment Planning Guide offers detailed information on all aspects of deploying Win2000. Both are available from Microsoft's Web site. Many other resources are also available at www.microsoft.com/windows2000.

In addition, third-party consultants trained in deploying Win2000 in enterprise environments are waiting to be called in to your site. Bringing in these people can save both time and money when your IT staff isn't up to speed on this technology.

You must consider many factors when planning to move to Windows 2000. Don't jump into an upgrade before weighing the benefits you will receive with the many costs involved.

If you follow these steps, take the time to double-check hardware and software infrastructure, and take detailed notes, the move to Windows 2000 should be a smooth one. Ensure that both your IT staff and end-users receive adequate training before making the migration. If you do thorough research and plan the migration well, you will significantly reduce the costs of migration.

Senior Analyst Kevin Railsback (kevin_railsback@infoworld.com) covers network management, Linux, server hardware, NOSES, and help desk solutions.

► Product review: Server operating system

Server enhancements worthy, but costly

■ Upgrade gets you speed, but migration costs may deter

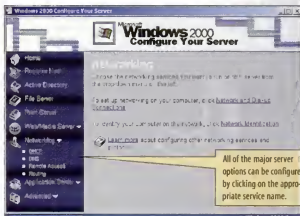
By Kevin Railsback,
InfoWorld Test Center

WE'VE HEARD the hype about Windows 2000, and we've watched the ship date slip. After testing Windows 2000 at last, I can report that it was well worth the wait. Windows 2000 Server and Advanced Server are not only easier to install and administer than Windows NT 4.0, but they also offer considerably faster performance.

Large-scale deployments will benefit greatly from Active Directory (AD). It offers a highly scalable and easy-to-administer directory system for all Win2000 applications and services. Also, the advancements made in reliability, specifically with clustering and built-in load balancing, mean less costly downtime for mission-critical applications. The new features make Win2000 a better alternative in the enterprise to NT.

Unfortunately, the high costs — many thousands of dollars, in most cases — of migrating to the new server OS may cause many businesses to shy away from it immediately.

I recommend taking the middle road: Deploy Windows 2000 slowly, bringing its power and flexibility into your environment without the exorbitant costs



WINDOWS 2000'S CONFIGURE YOUR SERVER wizard saves time when setting up servers by linking typical configuration tools in one UI.

of a one-time migration. Buy new servers with Win2000, but keep most old servers running NT 4.0. This way, users can be trained incrementally and bugs can be worked out without causing expensive downtime.

After many months of delays, Microsoft has come through with a strong upgrade to the Windows NT Server platform. Windows 2000 Server and Advanced Server are solid products, earning a score of good. Unfortunately, higher hardware requirements and steep

migration costs mean a slow move to Win2000 for most businesses.

The most significant enhancement is AD, which is integrated into every part of the Win2000 model. It allows for all applications and services to communicate with one information directory.

Windows 2000 Server

The Server edition provides a basic level of network functionality for a reasonable price. It offers a full suite of network services, including file and print, Web, and FTP services and support for a wide range of application services such as e-mail and database servers.

These services have been updated and performance optimized for modern server hardware, giving Win2000 a performance edge over NT. And the integration of AD greatly increases Win2000's scalability in large environments.

Server is a good fit for most situations requiring NT Server 4.0. But for higher-end implementations the load balancing and fail-over capabilities of Advanced Server make it a better choice.

Server's price is reasonable at a \$1,199 to 10 client-access licenses or \$599 to upgrade. The costs as associated with upgrading existing hardware and software to Win2000 compliance make it a better option for deploying with new servers.

I upgraded an existing NT 4.0 server running on a Hewlett Packard NetServer LX Pro with quad Pentium Pro 200-MHz CPUs and 512MB of RAM to Windows

► SERVER PAGE 31

Bolster your effort

Do not hesitate to track down additional resources to help ease the Win2000 migration process.

► www.microsoft.com/windows2000: This site provides detailed information about all aspects of Windows 2000 Server and Professional.

► **Windows 2000 Server Resource Kit:** From Microsoft's Web site, it's a must-have for your IT staff.

► **Windows 2000 Server Deployment Planning Guide:** This is an excellent resource for planning your migration to Win2000. You can download it from Microsoft's site.

► **Web-based training:** Pearson and Learn2Learn have partnered in an effort to train resellers and customers in Win2000 technology.

in and access all of their drives and other resources. Double-check your security settings and other server configuration options.

Completely test every aspect of the new Win2000 environment. It is especially important to check the AD structure for anomalies, such as missing domain or user information. Then have a small subset of users log in and use the new servers. If everything goes smoothly, you're ready to plunge the entire organization into Windows 2000.

Client migration

After going through the server migration, the update to Windows 2000 Professional on your desktops will seem like a walk in the park.

Professional has more rigorous hardware requirements than previous releases, but it supports a much wider range of system components and peripherals, making the move from Windows 95 or 98, as well as from NT 4.0, an easy one. Keep in mind that IT staff and end-user training on the new system will be

THE BOTTOM LINE

Windows 2000 Server and Advanced Server

BUSINESS CASE
The high costs of moving all existing servers to Windows 2000 will limit its immediate adoption. In the long term, Windows 2000 Server editions will be worth the investment, but rolling them out slowly will reduce overall costs.

TECHNICAL CASE
Windows 2000 Server offers a good combination of networking services for most situations, and Active Directory is a good update to the older Windows NT domain system. The addition of clustering and network load balancing makes Windows 2000 Advanced Server a good choice for high-availability situations.

PROS

- Much wider range of hardware support
- Windows Terminal Services integrated into the OS
- Support for eight-way systems and as much as 4GB of RAM in Advanced Server
- Active Directory fully integrated into all aspects of the OS

CONS

- Few current applications optimized for Windows 2000
- Significantly higher cost for Advanced Server edition

COST

- \$1,199, Server (\$599 upgrade) with 10 client-access licenses;
- \$3,999, Advanced Server (\$1,999 upgrade) with 25 client-access licenses

PLATFORMS

- x86-compatible server hardware

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Server

Continued from page 36

2000 Server. It had been my domain controller, so all of that information was migrated into AD. I found that Win2000's performance on this machine was more than 22 percent faster than NT Server 4.0.

I connected to the new server from several client machines. I could log on using my old domain username and password. I had

centralized access to information.

Windows 2000 Advanced Server

Advanced Server adds several enhancements to all of the features of Server. On the hardware side, it supports as many as eight CPUs; Server supports four. Also, Advanced Server can address as much as 8GB of RAM using Intel's Physical Address Extension (PAE) technology. Server can access also 4GB.

Advanced Server offers several additional software features. Network load balancing allows incoming traffic to be distributed to several servers, providing quicker response time and making it easy to expand capacity. Also, two-node server clustering protects critical applications from downtime, allowing servers to fail-over. This will help keep costs down in mis-

\$1,400 more for the upgrade than the Server edition.

I installed Advanced Server on a Gateway ALR 7500 server with dual Pentium III 550-MHz CPUs and 512MB of RAM. In performance tests on this system, Advanced Server was more than 32 percent faster than NT Server 4.0.

With another Advanced Server machine set up, I installed Network Load Balancer. It was easy to configure. This feature is perfect for high-load services such as Web and FTP, allowing a group of machines to share the load.

Looking ahead

A third version of Windows 2000, the DataCenter edition, will be designed for high availability data center use. It promises even higher performance levels for enterprise-level applications, supporting more RAM and CPUs. DataCenter is slated for release in Q2 of this year.

According to an October 1999 study from the Gartner Group, many IT administrators believe that they must upgrade to Win2000 because NT 4.0 will no longer be supported. Microsoft will continue to sell and support NT to retail customers until the end of 2001 and through 2004 for Select and Enterprise customers.

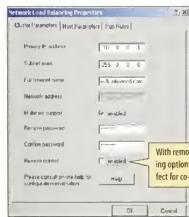
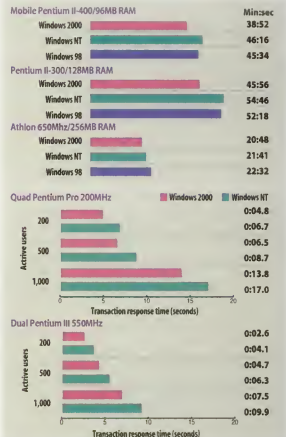
Windows 2000 Server and Advanced Server are high-quality follow-ups to the Windows NT family. Extensive enhancements in both directory services and system performance make it a good choice for new implementations. However, the high costs of migrating existing environments to the Server platform and more advanced system requirements will limit its usefulness for the near future in many existing environments. Consider

deploying Win2000 on a server-by-server basis instead of undertaking a massive, expensive one-time migration to the new OS.

Senior Analyst Kevin Railsback (kevin_railsback@infoworld.com) has administered and tested NT/2000 for eight years.

Windows 2000 performance shines

On both the server and client side, Microsoft Windows 2000 performance is noticeably faster. We used Benchmark Systems' 2000 to test client performance and found that Windows 2000 Professional is four to 19 percent faster than Windows NT on the same machine. We also tested the Web serving capabilities of Windows 2000 Server using Mercury Interactive LoadRunner. E.G., Windows 2000 Server was more than 22 percent faster than NT Server 4.0 on a quad Pentium Pro 200 server and more than 32 percent faster on a dual Pentium III 550 with a load of 1,000 active users.



ADVANCED SERVER includes Network Load Balancer, which allows multiple servers to share the network load.

seamless access to NT 4.0 servers in the original domain, even though the domain controller used AD.

I set up Microsoft's DFS (distributed file system) on the new server and created a DFS drive. I pulled in shares from several servers under the DFS share. I was impressed with the ease with which I could set up distributed file services. This will be a major benefit for organizations that use several file servers but want

mission-critical environments and ensure that service is available to your users at all times.

Advanced Server is a good fit when high server uptime is a critical consideration. It gives users a reliable server and excellent performance on high-end hardware. With support for eight CPU servers and as much as 4GB of RAM, Advanced Server has the horsepower necessary to run large mission-critical applications.

Unfortunately, the additional power costs a lot more money. Advanced Server is \$2,800 more per server for new installations and

Product review: Desktop operating system

Robust client offers wide device support

Integrated with AD, Professional lowers admin costs

By Mark Pace, For InfoWorld Test Center

IT ADMINISTRATORS choosing a desktop OS have juggled between Windows 9x and Windows NT Workstation. Most users would have preferred NT Workstation, but its hardware requirements and lack of support for lots of laptop-oriented services forced many IT managers to choose Windows 9x.



Windows 2000 Professional is designed to resolve such problems. Although it has its drawbacks — legacies from NT Workstations, decreased hardware support, and increased resource requirements — Professional promises that a single desktop OS may be run across the enterprise without the trade-offs previously experienced. Professional scored a very good.

Its support for more hardware and increased usability on desktops and laptops make it a worthwhile upgrade. The integration with Active Directory (AD) makes it easier to deploy and support than Microsoft's previous OSes.

When deploying Professional, the costs of the installation and required hardware upgrades will be the largest deterrent. However, Professional includes features that ease rollout and administration as well

BOTTOM LINE

Windows 2000 Professional

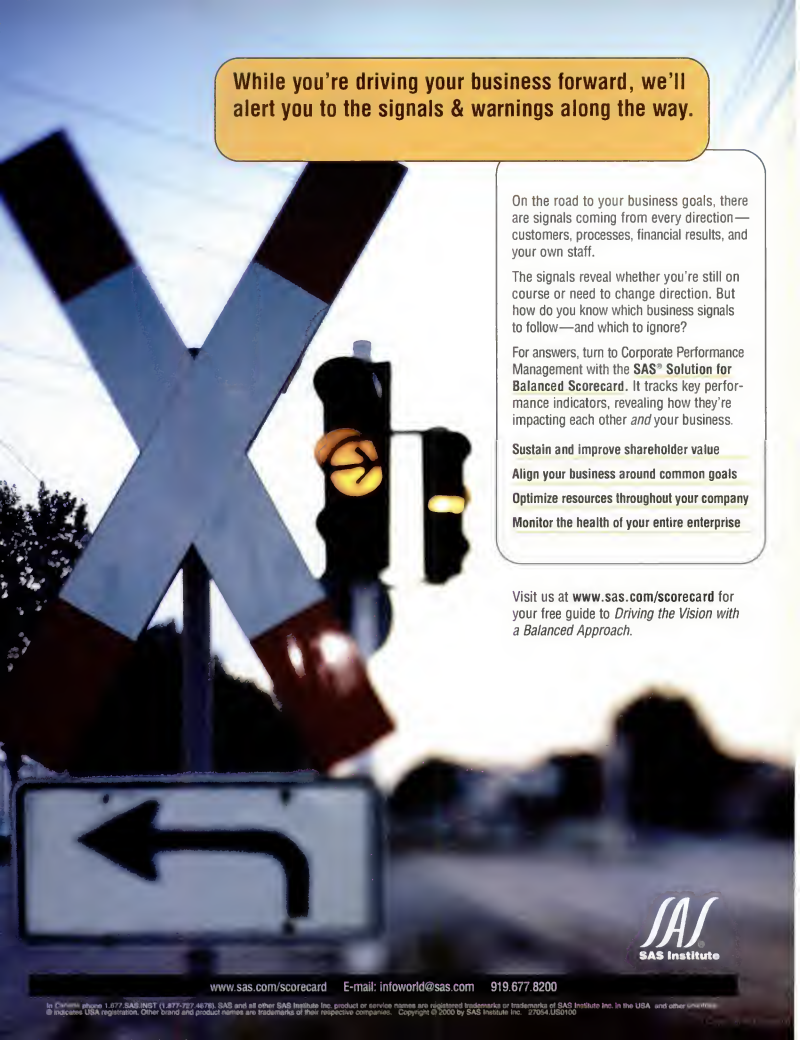
BUSINESS CASE
With support for AD, IntelliMirror, and other features that protect commonly corrupted or easily replaced DLLs, Windows 2000 Professional will reduce administrative overhead for supporting a large number of Windows desktops.

TECHNICAL CASE
Professional offers improvements in usability and greater support for laptop-oriented services. Other features, such as support for DirectX, make Professional's support for graphic and sound applications much better than its predecessors.

- PROS**
 - AD support allows single-point login access
 - Windows File Protection ensures system files are not replaced or corrupted
 - New features make Windows 2000 viable for laptop use
 - Improved UI and video performance
- CONS**
 - Does not support as much hardware as Windows 9x
 - Requires double the memory of Windows 9x
- COST** \$319 (5219 upgrade)
- PLATFORMS** x86-compatible client hardware

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Professional

Continued from page 38

as increase users' productivity.

Installing Professional is very similar to installing NT Workstation, and the first noticeable differ-

ence is the boot screen — replacing the famous initial blue screen is a colorful splash screen similar to Windows 9x.

More importantly, Professional offers a Safe Boot mode that lets you bring your system up with a minimal set of drivers so you can change the configuration of the

machine. This can prevent having to restore from a backup or reinstall NT because of a misconfiguration or a bogus driver.

Also available either from the boot CDs, boot floppies, or the boot menu is the System Recovery Console. With this it was able to access the files on my NTFS (NT File System) even when the unit was not bootable using the Safe Mode. As a last-ditch effort, you can at least recover files from the drive without having to put the drive in a different NT machine.

Professional also offers a slightly altered desktop UI. Certain configuration items such as printers that used to appear under My Computer have been moved to the control panel, and Internet Explorer 5 features, including the Web Folders and My Network Places, have been added. This should make it easier for users to find their data even if they don't know where it is on the network.

One of Windows' biggest problems has always been what happens to the system when a DLL (Dynamic Link Library) is corrupted or replaced by a different version. In response, Professional offers Windows File Protection, which keeps backups of the correct versions of important system files and replaces them when they become corrupted or overwritten.

To test this, I deleted some important DLL files. Quickly it noticed the problem and restored the files from its backup. This feature could save users and administrators great amounts of time troubleshooting application crashes.

In addition, Professional offers new administrative tools to help the rollout, configuration, and maintenance of software on desktops. In-



PROFESSIONAL'S ADMINISTRATIVE TOOLS have been moved to the Control Panel, reducing confusion for users new to Windows 2000.

tellMirror tells you install software packages across an enterprise of machines, and Sysprep and the Remote Installation Preparation utility help prepare machines for local Professional or network rollouts. When they are used with AD and Windows 2000 Server, you can perform desktop maintenance from centralized locations much more easily than with NT Workstation or Windows 9x.

Professional also introduces new laptop features, including advanced power management support. This function kept my laptop running almost one-third longer than it ran under NT Workstation. And I was able to use my removable hard drive for the first time without rebooting. I liked also the addition of the synchronization manager, which helped keep offline files up-to-date when I was on the road.

Other improvements include a

reduced number of necessary reboots plus enhancements to TCP/IP, which helped speed access to Web sites and increased file and print performance while it was connected to my LAN.

Although you still must reboot for some changes, such as adding a video driver, many other device changes such as sound cards and removable hard drives can be added and removed without rebooting. Professional is a definite improvement over Windows 9x and NT Workstation. Because of its improvements in usability plus potential for reducing training and administrative overhead, IT administrators should seriously consider making the upgrade.

Mark Pace (pace@frnk.com) is a free-lance writer who has been working in the computer industry for over 15 years.

Windows 2000 adds myriad features

Each iteration of the most recent Windows release provides different functionality.

Windows 2000 Professional

Professional replaces Windows NT Workstation, while offering the stability and scalability of NT Workstation. Its features include vast improvements that bring it up to par with Windows 98's graphical and sound capabilities.

- DirectX 7.0 allows video and sound applications as well as games to perform hardware- and software-based acceleration
- Connectivity as a client to Active Directory (AD) services, NT domain services, NetWare file and print services, and Unix NFS and printing services
- Supports two-processor SMP (symmetric multiprocessing)
- Requires 128MB for optimal performance
- Includes enhanced support for USB
- Supports mobile device power management and removable storage devices

Windows 2000 Server

Server, which offers enhanced application server performance, is designed for most situations. Its major enhancements allow it to serve as an AD server, making administration tasks much easier across a group of systems. Server also replaces Windows NT 4.0 Terminal Server by integrating those services with its native environment.

- Acts as an AD server
- Supports four-processor SMP
- Requires at least 256MB for optimal performance and 512MB if serving AD services
- Can act as a Terminal Server or perform minimal Terminal Server services for remote-administration purposes

Windows 2000 Advanced Server

Advanced Server offers all that Server does plus enhancements from NT 4.0 Enterprise Edition, including dual server clustering capabilities designed to provide a more robust and scalable around-the-clock architecture.

- Adds two server clustering services
- Allows for larger memory models (8GB)

Windows 2000 Data Center Server

Data Center Server will be available in the second quarter of 2000 and will offer as many as four server clusters. With the addition of hardware qualifications and the capability of clustering more servers, Windows 2000 will be more viable in mission-critical situations.

- Adds four server clustering services
- Requires certified hardware
- Allows for larger memory models (64GB)
- Adds the Process Control Manager

Product review: Third-party directory migration tools

DM/Manager makes AD upgrade a breeze

Keep users productive while resolving directory kinks

By PJ Connolly,
InfoWorld Test Center

IF YOU MIGRATE to Windows 2000, get ready for the extra expenses of upgrading to Active Directory (AD). Moving anything but the simplest domain structure to Microsoft's directory service calls for third-party utilities, which quickly drive up costs.

FastLane Technologies offers an

appealing alternative to multiple vendor strategies with DM/Suite, which provides administrative, development, migration, and reporting tools for \$25 per managed user.

DM/Manager 5.0 will greatly ease the upgrade to AD, which earned it a score of very good. It supports a variety of migration scenarios, including data extraction from NDS and LDAP (Lightweight Directory Access Pro-

toocol) directories, and allows complete domain collapsing and movement of resource domains to AD. Most importantly, DM/Manager also supports conversion of existing NT groups to the new AD group model, possibly the most complex part of a Windows 2000 migration.

FastLane understands that companies can't afford users to be idle while the IT administrator works out the kinks native to every migration process. Unlike competing products, DM/Manager does not

replace the standard security provider (as does Novell's NDS for NT), or split directory migration tools among multiple offerings (like Entevo's DirectMigrate products). Instead, DM/Manager provides tools that smooth the upgrade to AD, including a rollback feature that could save the migration if everything else goes wrong.

The rest of the suite will also prove helpful. DM/Consolidator 2.0 addresses the need for data migration tools. DM/Administrator 4.5 lets you create virtual domains and delegate mundane administrative tasks to trusted users, without granting them Administrator rights in Windows NT. DM/Reporter 2.5 features a set of reports designed to assist migration to Win2000. DM/Developer 7.0 is a scripting environment for creating directory

management applications.

The biggest concern when migrating to AD is resolving the myriad duplication of objects that follows as a by-product of building enterprise-scale directories with the NT domain structure. DM/Manager resolves this with its per-user, easy-to-use tools for manipulating the data during the transfer from old to new directories.

DM/Manager installs and sets up easily. It provides for a variety of possible installations, but the most common is for a Win2000 migration. This runs best on a Win2000 member server that is not a DC (Domain Controller), but if you intend to use DM/Manager's SID (Security Identifier) Histories feature, which allows you to roll back changes to SIDs, you must install DM/Manager

► DM/MANAGER page 42

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DM/Manager

Continued from page 40

to a DC in the target Win2000 domain. DM/Manager can perform migrations object-by-object or as part of a user-defined

project. FastLane supplies Project Wizards for migrating User, Group, and Computer objects to AD. Each wizard uses FastLane's Migration Mapping Technology (MMT) to collect the source and target information for the objects you're migrating and then stores this information in a project file.

This facilitates reversing a botched migra-

tion as well as importing data from other directory types. DM/Manager's near-total support for migration "undos" is one of its best features. If you properly plan your migration, you'll account for these points of no return.

It took less than 10 minutes to create a project for migrating users from a domain to AD. I liked the fine degree of control available,



DM/Manager provides a pane in its migration wizards for making last-minute corrections.

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through the menus and the MMT editor which provided a celled view of critical data and let me make last-minute changes.

Another example of DM/Manager's intelligent design is the way it preserves the all-important ACL (access control list) for objects migrated to AD. Instead of replacing the original (NT domain) SIDs, DM/Manager appends the updated (Active Directory) SIDs of objects to the ACL.

Additionally, the documentation is thorough and profusely illustrated. The manual is well-organized and useful. The notes of planning and implementation are particularly helpful because FastLane draws on the experience gained from supporting more than 600 migrations since 1996, including Microsoft's migration to Win2000.

Whether you splurge for the entire FastLane DM/Suite or opt only for DM/Manager 5.0, you will keep your users productive during the rocky road to AD. Its project-based interface offers a coherent view of the changes you make, and the superior rollback support makes it a must if you want to get an AD conversion right the first time.

Technology Analyst P.J. Connolly (pj_connolly@infoworld.com) covers security, client hardware, and OSes.

THE BOTTOM LINE

FastLane DM/Manager 5.0



BUSINESS CASE

DM/Manager enables a staged migration while maintaining access to critical data during all phases, minimizing downtime and keeping users productive and resources accessible in the event of unforeseen problems.

TECHNICAL CASE

DM/Manager 5.0 pulls directory data from a variety of sources and can revert migrations. It supplements, rather than replaces, the Microsoft-supplied tools.

PROS

- Supports role changes for domain controllers
- Limited undo of user and group migrations
- Scheduled distributed updating of local machines
- Allows for coordinated and staged upgrades

CONS

- Suite lacks common installer and interface
- No direct LDAP support

COST

\$8 per managed user; DM/Manager; \$25 per managed user; DM/Suite

PLATFORMS

Windows NT Server 4.0 with SP3, NT Server 3.51 with SP5, Windows 2000

FastLane Technologies, Halifax, Nova Scotia (800) 947-6752; www.fastlane.com

For a complete and unbiased evaluation, go to www.infoworld.com/method.

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Active Directory barks up the right tree

By Mark Pace,
for InfoWorld Test Center

MICROSOFT'S first attempt at providing true domain services similar to those in NDS is finally available. Released in Windows 2000, Active Directory replaces the Windows NT domain system. Although the path to upgrading to Active Directory (AD) may be difficult, all indications show that it would be a worthwhile one.

Directory services are important to any network administrator because they allow vast networks to be centrally managed. By adding directory services to networks, the cost of administration can be greatly reduced.

Administrators will like AD because it provides one interface for all administrative tasks. IT departments will spend less money on administration, especially if they already have multiple NT domains,

And because of AD's capability of serving all of Microsoft's clients as well as coexisting with current NT and NetWare servers, AD can be added without overhauling every server. Because AD replaces the current NT domain system, larger enterprises will find great relief from the costs involved in maintaining many domains using trust relationships.

In the beginning ...

Years before Active Directory, Novell released NDS, which benefited cross-platform shops, but NT-only shops continued to rely on the antiquated NT domain system. The domain system does not scale well with thousands of users, making it necessary in large enterprises to set up many trust relationships.

Microsoft set out to match NDS for NT-only shops with its own directory services. AD is designed to serve the enterprise needs,

including controlling vast numbers of users, allowing granular control over security and administrative tasks, and solving other shortcomings in NT's domain model.

If you continue to use NetWare, you will still use NDS, but if you upgrade to Windows 2000, you might consider subordinating Novell's product to Microsoft's rather than the other way around.

The laws of the forest

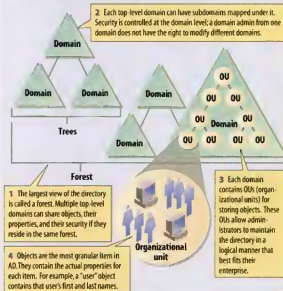
Similar to NDS, Active Directory uses a hierarchical model described by metaphors. A "forest" denotes parts of a network, whereby a "tree" can share information with other trees if it is a member of the same forest.

At the root of each tree is a domain, and in each domain an administrator can add more domains, such as OUs (organizational units)

► **ACTIVE DIRECTORY** page 47

Seeing the forest for the trees

Active Directory (AD) uses a hierarchical tree schema to store objects. A top-level domain in a forest might be `infolworld.com`, and its subdomains would reside under that; for example, a subdomain might be `test:center.infolworld.com`. Using AD, it is possible to manage a vast enterprise much more efficiently than with Windows NT.



SOURCE: MICROSOFT CORP.

BY KAREN HART

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Active Directory

Continued from page 45

and objects, the most granular items in AD. Each object is given a global unique identifier that is used as a permanent reference to that object; this identifier allows the object to be renamed or moved without causing any problems.

Fault tolerance provided

To provide fault tolerance, AD uses domain controllers. Unlike NT's domain controllers, AD's domain controllers are not grouped into primary or backup categories.

In the NT scheme, changes to the domain can be made only if the PDC (primary domain controller) is currently available, so although users can authenticate, administrative tasks cannot occur if the PDC is offline. Using AD, all servers can receive updates, which are replicated to the other servers in AD. This allows administrators much more flexibility in controlling servers — no more waiting for late-hour service windows to take down a DC.

AD is logically broken up into OUs and domains, but physically, an administrator will want at least one domain controller per site, thus providing redundant access to AD.

Replication between sites is controlled by AD replication services, which can be scheduled and also limited to a certain transfer rate to ensure that replication does not flood slow network links.

All of AD is controlled via the MMC (Microsoft Management Console) interface, which shows signs of Microsoft's efforts to re-use its UI design. The MMC is slick and easy to use, providing a quick view into all aspects of a Windows 2000 network. Configuring access to resources is as easy as, for example, locating a printer in the tree and then right-clicking it to choose properties. Using the MMC to configure a network is a great leap over previous methods, which required multiple programs and sometimes physical access to the console.

Exchange testing said it all

The depth of control and integration AD provides was evident in *InfoWorld's* testing of Exchange 2000 Server, beta (see www.infoworld.com/printlinks).

All of the administrative tasks were available from the MMC. For example, when you create users and put their full names in the user configuration dialog box, this information becomes instantly available to Exchange. With NT and the previous version of Exchange, you need to go to both the User Manager and the Exchange Administration program to manage this.

In addition, moving a user from one OU to another automatically updated the user's information in Exchange. It is also easy to configure a "tree" to allow certain people to administer just their area of the network.

As previous testing indicates, AD will provide myriad benefits throughout the Windows platform. It is a long-awaited, crucial addition to Windows. For many IT adminis-

trators, Microsoft's directory services may be the deciding factor when choosing to move to this platform.

Of course, because AD is new, don't expect a problem-free rollout; a bleeding-edge installation is not a wise idea. If you decide to move forward with AD, be sure to test it in a non-production environment. Also, look for

directory modeling software from Microsoft or other vendors to help you design the layout of your trees.

As new products with Active Directory support begin to appear, administrative tasks will be consolidated and made much easier. The ability to easily map rights to resources across domains and trees will give

users additional mobility within their organizations. Most of all, users will benefit from Active Directory as much as will network administrators.

Mark Pace (pace@frnk.com) is a free-lance writer who has been working in the computer industry for more than 15 years.



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WINDOW MANAGER · BRIAN LIVINGSTON

New program stops Windows 2000/NT/98 security weaknesses and Trojans for free

A NEW PROGRAM has brought together the strongest features of the best software firewalls, Trojan horse defenses, and Internet security tools. And best of all, this wonderkind of software can be downloaded for free use by individuals and non-profit groups. (Corporations and government agencies pay by license after 60 days.)

ZoneAlarm 2.0, for Microsoft Windows 2000/NT/9x, is a muscular big brother to Version 1.0, which I first wrote about in my column on Jan. 10 (see "To protect against Trojan horses, you will need a strong gate as well as a firewall," page 38).

ZoneAlarm has come a long way since the olden days (one month ago) when it only protected your PC against Trojan horses. Trojans sneak into your system via Web sites or e-mail and send data back to a hacker's server. Version 2.0 still protects against that, but now it is also, arguably, the strongest software-only firewall currently available. This

combination of firewall protection and the detection of unauthorized, outbound Internet traffic is a giant step forward that has impressed those who have tried ZoneAlarm 2.0.

Windows 2000 includes, for the first time, code that offers the capability of building a software firewall. But most of this capability resides in a new "firewall API." We'll soon see products from third-party Windows 2000 vendors that place a convenient user interface on top of this API.

Until then, ZoneLabs — the San Francisco company that produces ZoneAlarm — looks like it has a winner. Steve Gibson, a beta tester of ZoneAlarm 2.0 and the prime developer at Gibson Research, says ZoneAlarm "blows away BlackICE," a \$39.95 software firewall I described in my Nov. 1, 1999, column (see "Software solutions can provide remedies for Windows security risks lurking on the Internet," www.infoworld.com/printlinks). BlackICE "does nothing about outbound traffic," Gibson says, giving ZoneAlarm a major advantage in features.

Why is this important? Because virus writers are getting better tools to attack your company and your PCs every day. Not so long ago, viruses were spread mostly on diskettes. Now, e-mail and the Internet are the favored transmission methods.

Trojan horses, a special breed of viruses, are becoming an enormous concern. A PC can

catch a Trojan merely by browsing a Web site with a malicious ActiveX control or receiving a rich-text e-mail (no attachment required). Trojans pass right through hardware firewalls. Because the PC user initiated the viewing of the infected Web site or e-mail, a hardware firewall sees no overt attack to defend against.

Even more dangerous are Trojans that users may pick up while working on a laptop at home. When they bring their machine to work the next day, "They go past the firewall by walking in the door," says Gregor Freund, president of ZoneLabs. Once the PC is reattached to the corporate network, any Trojans inside the laptop may enjoy high privileges to read internal files and passwords.

You might say, "I'm too small for any hacker to be interested in my data." Think again. There has been an explosion of identity theft in just the past few years. Hackers obtain credit card or Social Security numbers, then rack up thousands of dollars of charges with new credit cards obtained in your name. Where do they get these numbers?

Financial firms are a favored target of computer criminals, but they're not the only worthy target. I once thought I'd never store my Social Security number on my computer. But then I used Windows 2000's Search feature to look on my hard disk for my SS number. I was startled to find over 30 documents where it

was stored. Over the last five years, I've carelessly entered these numbers into client lists, voices and banking forms, never thinking to clean the information off my hard disk.

Of course, now I'm using a hardware firewall from WatchGuard Technologies (www.watchguard.com) plus ZoneAlarm and anti-virus software to protect my office and high-speed Internet access lines. But many companies are not equally well-protected. The threat is real. ZoneLabs' Freund says he's detected variations of the well-known "BackOffice" Trojan horse in four e-mails he's received just in the past six months.

To download ZoneAlarm 2.0, go to www.zonealabs.com. After installation, I recommend you click the Help button (yes, really) and read all the capabilities of this sophisticated program.

And, like any "point-oh" release, there's still a bit of "oh" left in it. You should visit Steve Gibson's update page on ZoneAlarm www.gribson.com/zonealarm.htm. Gibson describes several quirks he doesn't like in Version 2.0 and announces when each one is fixed.

Most of the quirks are minor and won't keep you from using the product. Download it now, and e-mail me your experiences. Use "ZoneAlarm" as the subject of your e-mail.

Brian Livingston's latest book is Windows 2000 Secrets (IDG Books). Send tips to brian_livingston@infoworld.com. He regrets that he cannot answer individual questions.

SECURITY WATCH · STUART MCCLURE & JOEL SCAMBRAY

Windows 2000 looks like it's learned several important lessons regarding security

WHILE OUR COLLEAGUES detail their opinions on the various pieces of Microsoft Windows 2000 elsewhere in this special section, it naturally falls on us to tell readers what they can expect security-wise from the future of Windows. After working extensively with the final two release candidates for Windows 2000, we are going to lay it on the line and predict their actions for this OS.

One of the most visible security-related additions to Windows 2000 is Kerberos, Version 5, on which authentication and the new domain model is built. Kerberos is a network authentication protocol that provides strong authentication using secret-key cryptography. Kerberos has a long history in the security community, and including an open standard as such a critical piece of Windows 2000 architecture may just indicate a sea change at Microsoft. Of course, interoperability with other Kerberos Version 5 implementations will be challenging (see [broken\), but this is clearly a ray of daylight. One additional wrinkle will be changing from the Windows NT one-way trust model to the default two-way transitive trusts inherent in Microsoft's Kerberos implementation — this will make migration interesting at organizations with complex, multi-domain trust models. Microsoft didn't license Mission Critical's domain reconfiguration technology on a whim \(\[www.missioncritical.com\]\(http://www.missioncritical.com\)\); look for FastLane's product to play an important role here as well \(\[www.fastlanetech.com\]\(http://www.fastlanetech.com\)\); for a review of FastLane DM/Suite, see page 40\).](http://www.nrl.navy.mil/ICSS/people/ken/h/kerberos-faq.html#int</p>
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Another key standard, IPsec, forms the backbone of Windows 2000 network-layer security. IPsec has quickly become the standard for securing IP traffic via authentication and encapsulation using cryptographic algorithms. Its inclusion couldn't be more welcome. Thank heavens Microsoft seems to have dropped the pursuit of its mostly proprietary PPTP (Point-to-Point Tunneling Protocol) in favor of this complex but well-accepted open standard. As always, configuration changes can still lessen security (although the IPsec component of Windows 2000 can restrict connections to only trusted hosts if set properly), but in any event, we see the effectiveness of eavesdropping attacks fading.

And, of course, the integration of Windows 2000 with digital certificate technologies is readily apparent, with a built-in Certificate

Authority, SSL 3.0 (Secure Sockets Layer) support, and the CryptoAPI all making it easier for developers to code applications that rely on good of public key cryptography.

Buzzword compliance is one thing, but how does Windows 2000 hold up under fire? As we've seen with NT, backward compatibility is going to leave the traditional holes open until the last embers of NetBIOS and the LANMan hash die out, but

Windows 2000 has clearly staked out the gravestones of these insecurities. It takes a mere mouse click to make Windows 2000 run native TCP/IP, forever banishing the dreaded NetBIOS session

vulnerabilities that make NT such an easy target. And Windows 2000 will, of course, back down from Kerberos to LANMan authentication if prodded, so the LANMan hashes can still be found lying around for easy cracking. However, once legacy NT systems are upgraded, LANMan can go away entirely. Furthermore, the SAM (Security Accounts Manager) is SYSKEY'd by default and the hashes are no longer even stored there if Active Directory is installed. (SYSKEY was originally offered with a hot fix to Service Pack 2 to encrypt the password data within the SAM with a stronger 128-bit cryptographic key — rather than the 40-bit default.) Although pwdump2 will still work on servers without Active Directory, these improvements and a host of others are going to make life much tougher (as long as people de-

play them) for the average Windows hacker.

Windows 2000 will have a few new things to pick on, of course. Most obvious is Active Directory, which will likely be configured in backwards-compatibility mode for some time in most environments, leaving the LDAP (Lightweight Directory Access Protocol)-based directory open to revealing queries from tools such as [ldp.exe](http://www.idp.exe) from the Windows 2000 Resource Kit. Although Active Directory is the one piece of Windows 2000 that we're most skeptical about, we believe that it will ultimately deliver more granular access control over all aspects of the IT environment. Check out the Group Policy Objects and the Security Templates tool for a taste of what we mean.

So, after all of this backslapping, we'll hedge our bets by saying that time and rigorous public scrutiny of Windows 2000 will be the ultimate judge of its security. Who knows maybe new Microsoft CEO Steve Ballmer will make the ultimate full-disclosure gesture and carry out his intimation that portions of the Windows 2000 source code will be made public. We can dream, can't we?

What vulnerabilities have you already found in Windows 2000? Let us know at security_watch@infoworld.com.

Stuart McClure is an independent security consultant at Rampart Security Group. Joel Scambray is a consultant at Ernst & Young. They have encountered numerous technologies during their 10 years in information security.

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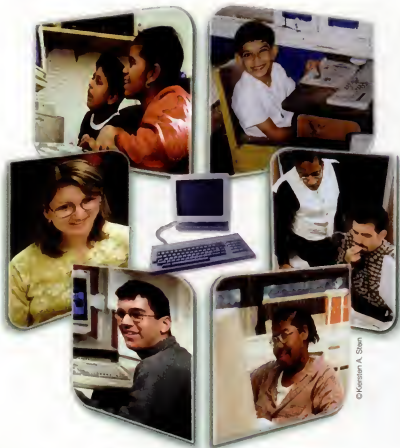
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The new wave of distributed computing

Microsoft's COM+ allows for more flexible application development

By Mario Apicella,
InfoWorld Test Center

SINCE THE VERY EARLY days of programming, developers have had to divide their coding efforts between two competing goals: On one hand, you must define the logic of the business context; and on the other, your program must handle the technicalities to support the application environment.

For example, an order-entry application has code to manage business functions (such as calculating shipping charges or pricing order items) and code to navigate the technical context (such as accessing the inventory database). The business-logic code usually gets most of the attention, while the technical code is generally seen as a necessary evil — a kind of technological tax that becomes more expensive as your environment grows in complexity.

But this technological toll is often the most expensive part of your code, because it's the part that can force a complete rewrite when moving an application to a new technical context. For example, if you decide to port a client/server, order-entry application to the Web, you probably won't have to change the business logic much (if at all), but the code required to navigate the new environment will be very different, and creating that code could cause your development costs to soar.

The Windows 2000 operating system offers COM+, the latest evolution of the distributed computing model, which incorporates the functionality of MTS (Microsoft Transaction Server) and promises a simplified programming interface open to future improvements. COM+ also makes it easier to use COM APIs across different services on the Windows 2000 platform, therefore cutting development costs. Bear in mind, however, that right now COM+ is only available if you use Windows 2000.

Microsoft created the original COM (Component Object Model) so that it could let users connect components to services residing either on the same computer or on another machine. If you've ever

dragged a Microsoft Excel spreadsheet into a Word document, you've had an embryonic example of COM in action (double-clicking the spreadsheet object in Word will fire up Excel). Expand the same concept to different services, such as transactional or queue management, and the same rules apply. For example, an object can request queue management services via built-in interfaces that become active at execution time.

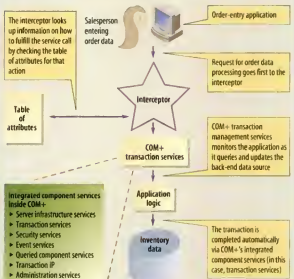
But one of COM's limitations is that the interface to request each OS service must be hard-wired into the application. For example, let's assume that an order-entry application contains interface calls to query an inventory database to verify and then update the inventory. In this scenario, the database must be immediately available; otherwise transactions will fail.

A better approach would be to store queries and requests for updates in a message queue, instructing the database server to read and write queued messages. This approach also makes applications more flexible, allowing them to be used from disconnected laptops, for example. But the technological tax is costly, because you'd have to insert new interface calls to handle queued messages, rather than having direct access to the database.

Enter COM+, which introduces an intermediate layer (known as the

Interceptor simplifies software development

The components of COM+ can change the behavior of an application on the fly by checking each action against a table of attributes, as in this example of sales order processing. This architecture greatly reduces the development burden when building new applications.



interceptor) between the application and the services. The interceptor is activated whenever an application makes a call for a service, and its role is to prepare the proper technical environment for the application, according to a table of attributes stored in a repository external to the application.

Therefore, using COM+, developers don't have to write extensive passages of code to make their applications context compliant. Rather, the various services that the context requires can be automatically set at execution time by the interceptor. You can even set different attributes to generate behaviors for the same application. At execution time, the interceptors will call the proper services according to the context and the property set.

Of course, the idea of an interceptor that automatically completes your application with OS services is not new. In fact, the concept was built into MTS. But in Windows 2000, the MTS services are integrated and interface-consistent with COM+, which is an added bonus for the developer because of the unified API semantic.

The interceptor is one of the most important innovations in COM+. From a developer's point of view, it's a godsend, because it makes developing code for distributed software much easier. It also cuts the programming cost where it is most expensive — coping with a constantly changing technical context. Think of it as Windows 2000's deduction to the technological tax.

But there's more to COM+ than the interceptor. You also get services that could suggest a future integration of MSMQ (Microsoft Message Queue) services. Again, by directly accessing COM+ and using a consistent application-program interface, developers can request queue application requests for services in the form of queued messages, rather than having requests sent

directly to the service's provider. Two components of COM+, a recorder and a reader, forward and retrieve those messages from the MSMQ server, hiding the different semantics that the server requires from the developer.

At press time, it was unclear if this feature will evolve in COM+-based support for messaging services — which would be a welcome new development. Right now, you can access message services either via the COM+ API (with some limitations, such as exposing the format of each message) or via native MSMQ calls. The current dual set of messaging service calls offered by MSMQ and COM+ could lead to confusion as to which one to use and when.

Finally, COM+ Events offer APIs to provide publish-and-subscribe services (which are again included in the underlying OS and consistent with the COM semantic). The new Event Services feature stores information about providers and subscribers for each event. You can define what must be monitored and who must be informed. For example, in our order-entry system, you could request notifications when the stock-on-hand quantity reaches the reorder point and automatically start an application to handle that event. These services could come in handy in situations involving an institutionalized information publisher and multiple volatile subscribers (such as retrieving stock market quotes or tracking fluctuations on the currency market).

All things considered, COM+ offers several attractive features that will let companies save time and money in the development and deployment stages. Again, however, COM+ is only available with Windows 2000, so any company interested in reaping the benefits of COM+ will have to weigh the technological benefits against the costs of ownership and migration.

Mario Apicella, a technology analyst for the InfoWorld Test Center, is a former programmer and database administrator. You can reach him at mario_apicella@infoworld.com.

THE BOTTOM LINE

Microsoft COM+

BUSINESS CASE

COM+ offers a simplified programming model that lets developers produce complex applications quickly, which translates to cost savings. However, COM+ is only available with Windows 2000, so companies will have to weigh the expected savings in development costs against the cost of migrating to a new OS.

TECHNICAL CASE

COM+ will provide more application independence from varied technical scenarios. COM+ can also simplify programming work and offer more flexibility in development and deployment among services with a common API.

PROS

- Consistent API for most development activities
- Flexible, run-time behavior of applications
- Simplified, attribute-driven programming model
- COMS

CONS

- Requires installing Windows 2000

Test Center Action Plan

Migrating your apps to Windows 2000

■ Moving to the new OS means complying with Microsoft's stringent new rules

By Mario Apicella,
InfoWorld Test Center

WHenever there's a major software release, IT directors face both good news and bad news. True, embracing the new approach may bring improvements in functionality, but then there's the inevitable hailstorm of glitches. This scenario is especially pronounced when it comes to an OS like Windows 2000, which includes thousands of modules and measures disk storage in hundreds of megabytes.

In this Test Center Action Plan, we'll show you how to make sure that your code will work on the new Windows 2000 bed. For information on the new development infrastructure that Windows 2000 offers, such as COM+, see page 51. Here we'll focus on porting the applications "as is" or without making code changes.

Take stock of what you have

The first step in your migration project is to create or update your company's applications inventory. Without a portfolio of applications, you can't make a precise estimate of the effort required to move to Windows 2000.

You may be able to use an old inventory left over from the Y2K project. But for Windows 2000 migration, your inventory should be more comprehensive: You'll want to detail each application module, track the flow of relationships between modules, and classify them by program-

ming language and application environment.

Make sure you're playing by the rules

Next, assess how much work (if any) each application requires to be a good Windows 2000 citizen. This is the most difficult part of the job and may require compromises. To help identify compliance issues in your code, you could use Rational Software's TestFoundation for Windows 2000, a free package that tests how your applications stack up against the Windows 2000 specification. The program is at www.rational.com/products/teamentest/w2k/w2kds.jmpl.

Thankfully, Windows 2000 is binary-compatible with previous Microsoft operating systems, so existing software should work. Just bear in mind that whenever you move to a new environment, the probability of success depends on how compliant the applications are with safe programming practices. For example, in DOS, it's possible for a program to access the file system without using the standard APIs, but an application that does this won't work on Windows 2000. Actually, a DOS application that bypasses APIs won't work on Windows 98 or NT 4.0, either. But Microsoft has imposed even more demanding rules of behavior for apps running on Windows 2000:

Among other things, applications must now perform proper version checking, recognize overwrite rules, and install and uninstall according to Windows 2000 standards. (You can download a list of the specifications at msdn.microsoft.com/certification/appspec.asp.) Depending on the complexity of your software, you may be faced with significant rewrites.



IBM/ISTOCK

On the other hand, following those requirements verbatim could significantly increase the effort required to move your applications to Windows 2000. Our recommendation is to evaluate the costs and risks associated with each of Microsoft's suggestions, then create two lists: a "must-do now" list and

an itemized follow-up of points to address after the migration to Windows 2000. After all, not every modification is mission-critical. For example, one of Microsoft's new rules is that your software should not make changes or read from system configuration files such as `config.sys`, `autoexec.bat`, `win.ini`, and `system.ini`. If you have more important issues to address, you may want to make the system configuration adjustments after porting your applications to Windows 2000, ensuring that, until then, your system files remain consistent with your applications. (See "Making the jump to Windows 2000" for the minimum actions required for each pre-Windows 2000 OS.)

Other times you won't have that option, because some of Windows 2000's new standards will prevent your software from running—such as the feature that won't allow key operating system components to be replaced. If your software setup replaces system modules or fonts, you'll have to make changes.

Test your applications on the new platform

At this stage, you have a detailed inventory of your applications, and you know what's needed to make them compliant with your migration project. At the end of this exercise, you should have some dollar figures to put in your migration budget. Your next step should be to run your software on a test bed to ensure that everything works.

Have a test plan ready for each application defining the individual elements of your testing activity. For example, you'll want to ensure that your application will install and run correctly on a Windows 2000 machine, that it will survive an update to the new OS, and that changing code to comply with Windows 2000 won't cause your software to fail on previous versions of Windows.

To test these behaviors, you'll have to prepare several clean testing scenarios, making sure that you can back up your systems to pristine status after each test cycle. This

MIGRATION STEP-BY-STEP

- 1 Take an inventory of your applications. Document relationships among modules and group your applications by OS and programming language.
- 2 Analyze Microsoft's application specifications for Windows 2000.
- 3 Define, according to the time and resources available, a minimum set of requirements for the migration.
- 4 Analyze each application and define Windows 2000 compliance actions. Estimate the time and resources required for conversion and testing.
- 5 Prepare test bed and start the testing cycle. Revise deployment documentation after each cycle.

calls for a lot of configuration work that, fortunately, can be lessened using tools such as Ghost from Symantec. Similarly, Rational's TestFoundation for Windows 2000 can take snapshots of your Windows registry and file system before and after installing an application, automatically documenting changes and compliance problems.

Migrating applications to a new platform can be such a tedious project that, in many cases, the effort involved convinces IT departments not to migrate at all. But Windows 2000 will ship with many excellent features—with the promise of much more to come—that could, in the end, make your system easier to program and less expensive to maintain.

Mario Apicella, a technology analyst for the InfoWorld Test Center, is a former programmer and database administrator. You can reach him at mario_apicella@infoworld.com.

Making the jump to Windows 2000

Current application environment	Probability of success	Probability of future problems	Action	Recommendations
DOS	Good	Excellent	Investigate access to configuration files and noncompliant behavior	Plan to replace with new applications
Windows 3.x	Good	Excellent	Investigate changes to configuration files and noncompliant behavior	Plan to replace with new applications
Windows 95/98	Excellent	Moderate	Investigate calls to 16-bit DLLs; investigate install/remove behavior for system modules and shared DLLs	Rewrite falling 16-bit DLLs; correct install/remove logic
Windows NT	Excellent	Poor	Investigate install/remove behavior for system modules and shared DLLs	Correct install/remove logic

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- Challenge 3:* GE wanted to demonstrate Internet-enabled smart concept appliances at the International Builders' Show.
- Challenge 4:* INVENSYS wanted a local area device-networking solution for their home and light industrial ControlServer™ and SmartModule™ products.
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Application changes, training needs lead to tricky Windows 2000 cost/benefit analysis

AS MICROSOFT begins the rollout of Windows 2000, I'm certain many of you are beginning to examine the impact the release will have on end-users, servers, network infrastructure, and business initiatives. This is a great time to complete a comprehensive cost/benefit analysis so you can determine what your next steps will be.

Some of the factors you'll need to consider are obvious. For example, there are Windows 2000 licensing fees and support costs to contend with. Nothing mysterious here.

Windows 2000 comes with some complicating factors, though. The release requires significantly more memory and disk space—both on the client and server sides of the equation—than prior Windows versions. Thus, you'll need to weigh whether it is bet-

ter to upgrade existing systems or purchase entirely new units. Many sites may find it easier to buy new systems with Windows 2000 configurations preloaded on the machines, which would save administrator time.

I also think it is crucial to investigate hardware and software alternatives during the cost/benefit analysis phase. Are there other less costly options, such as open-source solutions, that may support business initiatives and technology requirements just as well as a Windows 2000 upgrade?

Those analyzing the Windows 2000 upgrade route will likely find two aspects that will significantly complicate the cost/benefit analysis: applications and training. The investments required and the availability of applications and training may delay your Windows 2000 upgrade plans or cause you to take an alternate fork in the road.

Current Windows customers who are using packaged applications will want to keep abreast of which software products are "certified" for Windows 2000. Microsoft's site lists the applications that are currently Windows 2000-certified at www.microsoft.com/windows2000/upgrade/compat/certified.asp. As of this writing only seven applications were certified.

However, the number of certified applications is expected to jump this year, according to Microsoft, third-party providers, and industry analyst statements.

You can search for packaged applications at www.microsoft.com/windows2000/upgrade/compat/search/default.asp. Your cost/benefit analysis will need to factor in the availability of your packaged applications.

If your company develops its own custom Windows-based Web or client/server applications, your cost/benefit analysis will need to account for the development requirements needed to make your applications Windows 2000-compatible. You'll find a bevy of Windows 2000 development-related information at msdn.microsoft.com/windows2000.

If you've implemented custom applications that support critical business functions, your cost/benefit analysis should reflect costs of the project(s) and time needed to modify the software for Windows 2000 compatibility.

Quite often, training is a consideration only after the fact. When it comes to Windows 2000, you need to consider training very early in the strategic planning phase.

The largest expected Windows 2000 training expenditures will likely occur in educat-

ing network administrators and developers. Several education options are available from Microsoft as well as third-party training providers.

Your cost/benefit analysis will need to factor into the cost and type of training you'll need. Will classroom coursework be needed? Will online or self-paced Windows 2000 modules suffice? A good point to begin researching training options can be found at the Microsoft Web site, www.microsoft.com/windows2000/training.

I am certain that there will be early adopters of Windows 2000, as there are with many competing technologies. However, most sites will need to perform a detailed analysis that includes potential alternatives to determine if this Windows is a good match for business initiatives and the bottom line.

It is one thing to analyze the hardware, licensing, support, and networking implications of Windows 2000. Underestimating or ignoring issues such as business application readiness and corporate education may complicate your organization's plans. Are you analyzing the impact of Windows 2000? Write to me at maggie_biggs@infoworld.com.

Maggie Biggs is director of the InfoWorld Test Center.



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Microsoft's Allchin backs all-inclusive OS strategy

FEB. 17, THE day Microsoft launches Windows 2000, will be an important date in the life of Jim Allchin. For the past four years, Allchin has led the charge at the Redmond, Wash., company for Windows NT 5.0, now Windows 2000. Recently promoted to group vice president of the Platforms Group, Allchin is one of the senior Microsoft executives who are "betting the company" on the next-generation operating system.

Allchin recently talked about Windows 2000 — and Microsoft's expectations for the product — with *InfoWorld* Editor in Chief Michael Vizard and Associate News Editor Bob Trott.

Because the experience with NT has been widely varied, how do you know Windows 2000 is going to be as reliable as you say?

We spent \$160 million, give or take, just on the reliability aspects of the products, so we've taken it very seriously. That includes the tools we've focused on as well as the analysis. We went out to many different corporate sites, [and] Internet sites, and gathered and audited the data from their systems. We went and methodically addressed the problems that we found. But the proof is, "Hey, try the product."

How broad has the testing been outside of Microsoft?

There's a whole set of people, both current companies in intranet as well as Internet sites. Customers like Barnes & Noble has been running the software for some time. They ran it through the Christmas season on their fulfillment system, I believe. There are a number of dot-coms that are running in production right now. And, of course, Microsoft [Windows 2000] is on well over 50,000 clients and probably 1,000 servers, or it actually may be above that. It's a large number of servers — every one of our line of business applications, our Internet sites, all the pieces of Microsoft software, they're all running on it. We've got a lot of exposure to this software.

Is Windows 2000 optimized around a client/server mentality, or a Web mentality, or does it matter?

You get benefits without even touching the Internet. If you touch the Internet, you'll find that our support of networking protocols is just superior. One of the things I'm super proud of in Windows 2000 is

the level of Internet protocols and the flexibility there. Whether it's the quality of service or whether it's multicasting or the IP security, it's just an incredible array of support there. On the client we have very capable XML in the browsing part of the system, and on the server we really have beefed up the Web applications environment so you can write applications very fast, and they're more secure and they're more reliable than they've ever been in the past. It's hard to buy a platform with as much technology

ties like transactions and the like tested, it's not a builder's special. On the Solaris side, [and] the Sun side, I think it's flat price-performance. The question is: Do you want a proprietary Sun solution that's dramatically more expensive, or do you want industry-standard hardware with an operating system with Windows 2000 on it?

Now Bill [Gates] is working on something called Next Generation Windows Services. The description of that is it's a pure internet operating system. I'm a little



"I'm a hard-core believer that by integrating things together, things get simpler."

Jim Allchin,
Group Vice President,
Platforms Group, Microsoft

as we've put into it. We've thought about this problem in terms of the world the way it is today, and the world the way we think it's going to be in the future.

Right now, the majority of dot-coms and ISVs seem to be leaning toward Linux and Solaris. How will Windows 2000 change their minds?

Linux is this "handyman's special" operating system. You can tinker with it, and maybe the house won't be so straight when you're done but it feels good pounding the nails in when you're building it. For small and maybe even embedded systems, it's a system that is competitive. I think that there's nothing in Linux in the e-commerce space if you're going to run a reasonable-size business on it that somebody's going to consider it. Who knows what'll happen in the future, but that's what I see today. What you get from Microsoft Windows 2000 is a more integrated, holistically tested system that is capable as an e-commerce, mission-critical environment. Certainly, with all the facilities

undear what the relationship is between those two projects.

Conceptually, the way we attacked the Internet was to infuse Internet technology into our products. We infused it in all of our products, and we're a far cry from being done because there's always more to do. But there's another transition happening, and that's one of services. We want to infuse into our system the services the way we infused Internet technology. When the Internet started off, it was basically communications protocols — all you could do was send bits from one place to another. Then it turned into presentation, so that you could get these screens sent to you, and that's the world the way it is today. But the screens are static; it's sort of a dumb terminal world the way it's being done today. Imagine the next generation, which is a programmatic way to use the data that's sent to you. Certainly XML is a key building block for doing that, but that's insufficient. You need rich schemas and you need the ability to have a programming model

based on those schemas.

What kind of services in terms of training and migration tools do you have to help large corporate customers get to Windows 2000 from where they are today? There are more pages written in training materials for this product than anything we've ever done. There are more people trained in our product support organizations and our Microsoft consulting services and the third parties providing the service.

Is there any sense for line lines for upgrades to 2000 that people can plan on, or is there still very much a black art out there in terms of developing the OS?

I'm sure you've seen the code name Whistler, that's one code name, but even before Whistler we have Millennium coming. We always have new products under development — 64-bit, Datacenter — it's not like one release. There's a whole series of products that are going to come out.

Some of your competitors would argue that there's so much going into the OS, any one piece that breaks will have a disastrous effect across the board, and that putting everything into the operating system is inherently a bad design.

And if you didn't have all of the technology we have, what would you say? Exactly what they're saying. Of course the system's modular. Linux is a 30-year-old architecture. [It doesn't] even have asynchronous I/O, for heaven's sake. [Its] SMP [symmetric multiprocessing] is terrible. It's not about being modular; this is about integration and making it easier for customers. I'm a hard-core believer that by integrating things together, things get simpler.

What is it that Windows 2000 does with security that will make people's minds rest easier in terms of fighting off potential threats?

Security's a lot more than technology. We've spent quite a bit of time documenting the right processes to use. If you go to our security Web site, we have paper after paper on these processes. I believe if there's a commitment from us — there is a commitment from us — it's just as important a commitment to notify users if you find anything and also to help with educational materials about how to set up a Web site and do it in a simpler way. Over time, we'll come out with some scripts to customize a system in a particular model. We do have a security tool

that can help you analyze your system today... and give you a report back on the health of it. It depends on what level of security you want.

Are you tracking the ASP [application service provider] space? Is that a niche market or is that going to become the main market?

If somebody wants to run terminals into a system and run the apps all off the server, I say, "Hallelujah! We have Windows Terminal Server"; that'll let them do that. On the other hand, if they want to run a more balanced distributing model, then they can do that. If a company wants [to] completely outsource the management of their clients, and let a company like CenterBeam actually do the management, then I think we've got the facilities to do that. We're trying to give [a] flexible computing model set of choices to somebody. In some cases they'll use it within their own company in two different ways. I believe it's the flexibility — that's the core thing we're offering.

So when it comes to thick vs. thin, you're agnostic?

I'm a distributed computing guy. I don't believe centralized computing is the answer to scale. Although I do like the idea of e-sites being built out of commodity pieces being put together, so you can get scale that way. But that, even inherently, is distributed. I like a personal environment; my perfect world is I want to be able to roam anywhere and get information from services in the sky, but I want to be able to have my information with me so I can use it regardless of where I'm at. There's a set of people who believe we're going back to centralized computing, and I'm not one of them. I believe we can have the power of centralized computing, but do it in a decentralized way. I've called it logically centralized but physically decentralized. That, to me, is the future.

What's the status of Windows 2000 Datacenter as far as production — who's it for, and why do they want it?

It's under development, we're waiting for hardware right at the moment. As soon as we get enough hardware that we feel good about testing coverage of it, then we'll ship it. In terms of true code development, it's done. In terms of who it's for, it's for the most mission-critical, high-end systems you can imagine.

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IT proceeds with caution

Many IT pros are weighing critical upgrade issues, asking themselves when — not if — they'll move to Windows 2000

By Bob Trott

BRIAN JAFFE has read all the articles and reviews, he's heard years' worth of hype and sales pitches from Microsoft, he's watched the betas come and go, and he's heard all the arguments, pro and con.

Now he just wants to get down to the business of Windows 2000.

"We're excited, we're optimistic, we're hopeful," says Jaffe, a New York-based IT director at a national company. "Hopefully, the rewards are going to be there. The rewards had better be there."

There is fertile ground for Windows 2000 at enterprises everywhere. According to *InfoWorld's* 1999 State of the Enterprise Survey, 99.4 percent of businesses use Windows as their primary desktop platform; 80.1 percent say Windows is their primary platform for Web servers; and 81.4 percent use the ubiquitous operating system as their primary application server platform.

When Microsoft executives said in 1997 that they were "betting the company" on Windows 2000 — due for a formal launch next week, and already up and running in many

enterprises — they weren't exaggerating.

Nevertheless, IT managers aren't concerned with Microsoft's financial fortunes as much as they are with Active Directory challenges, weighing alternatives such as Linux, and ensuring security and stability for new dot-com ventures. Just more than half of the IT managers participating in the *InfoWorld* survey said they plan to implement Windows 2000 this year.

Active Directory dilemma

Windows 2000's fortune will likely be made or lost on the server side. With Active Directory, Microsoft finally is offering a complete directory solution. Microsoft is just catching up to old hands at directories, most notably Novell, but the pervasiveness of Windows almost ensures that a Windows-based directory will enjoy a large measure of success.

"Most people, including those strongly in the Active Directory camp, seem to think that it's a first-generation directory service and it's

not quite there,

it's not quite as competitive across the board as far as NDS is from Novell," says Dwight Davis, an analyst at Summit Strategies, in Kirkland, Wash.

"The gap certainly will close dramatically with Active Directory," Davis adds. "NT's directory services have been fairly widely deployed, even given its reputation as a dog, and Novell hasn't taken over the world. You have to assume Active Directory is going to do pretty well."

www.infoworld.com

WINDOWS 2000 DESKTOP DILEMMA

For a news analysis of Windows 2000 desktop replacement issues, go to www.infoworld.com/printlinks.



Gaining control of networked servers and PCs with Active Directory will come at a price — familiarization with a brand-new technology. Therefore, many IT shops proceed slowly and cautiously.

"There hasn't been a [Windows] directory before, there's just been trees and network diagrams and information about who is on your network," says Dana Gardner, an analyst at the Aberdeen Group in Boston. "This conversion will require people to really do some work."

"It's going to be starting from the ground up in the domain infrastructure," Jaffe says.

A mini-industry has already sprung up to meet this challenge, with companies such as Entevo and FastLane offering Active Direc-

tory migration help. Dell Computer, Compaq Computer, and Hewlett-Packard—which, in addition to being solid Microsoft partners, have rolled out Windows 2000 internally—also have come out with migration services for Active Directory as well as other aspects of Windows 2000.

"The sooner you get to a directory structure, and the more centralized you make repositories and storage in your organization, the much better off you're going to be doing business-to-business and business-to-customer [transactions] later on down the path," Gardner says.

Open-source Linux is also steadily gaining acceptance on the server end of the enterprise (see "Linux presses forward," Jan. 31, page 32). Its price tag—free—is appealing, as is its reliability and the burgeoning developer community surrounding it. Microsoft is worried about Linux, but for now Windows still rules the roost (see chart, right).

"Linux has been somewhat suspect in performance compared to NT 4.0, and if Windows 2000 raises the bar, it raises the bar above where Linux is competing," Davis says. "On the other hand, there's no stopping Linux being the key alternative to Windows 2000 for as far as we can see."

E-business expectations

E-commerce will be the focus of a large portion of Microsoft's marketing blitz around Windows 2000, which offers Internet Information Server (IIS) 5.0, Internet Explorer 5.0, and other

Supermarkets.com began converting to an all-Windows 2000 environment in mid-November, finishing up in December. Banker says the server upgrade hassles were minimal, and Web performance reliability has increased dramatically.

"We're running SQL Server 7.0 and have seen a fairly dramatic improvement in query time," Banker says. "On the Web servers, running IIS 5.0 and Windows 2000, we were seeing increases on the order of 70 percent throughput from the FastTrack servers we were running from Netscape."

Critical application support

Likewise, adoption in the ASP (application service provider) market will weigh in heavily to Windows 2000's overall market share.

"Telcos and network service providers, ASPs and ISPs, have all been growing as important players in the distribution of software functionality," Davis says. "With Windows 2000, Microsoft clearly thinks it has a much better horse to ride into battle to get these folks as customers. They will emphasize the new ASP channel as one they are especially targeting in that regard. They need a platform that actually runs 24 hours a day, and on bigger hardware configurations."

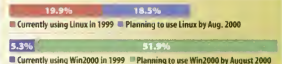
As the Feb. 17 launch date nears, only seven vendors worldwide have Windows 2000 certification, meaning they are equipped to exploit the system's new features. They are Caere's OmniPage Pro I.0, Damgard's Aapta, Executive Software's DisKeeper Workstation, Gemplus's GemSafe, Navision Financials, Scanlon's TextBridge Millennium Pro, and WRQ's Reflection for HP.

But if the number of Windows 2000-specific applications is small—a situation Davis blames on Microsoft's foot-dragging

Not all Windows-based shops moving forward with Windows 2000 this year

Although about 57 percent of IT managers surveyed by InfoWorld said they use Windows as a standard platform, only about 57 percent said they will have adopted Win2000 by August.

Operating system a doption



SOURCE: INFOWORLD 1999 STATE OF THE ENTERPRISE SURVEY

with application specifications, and Microsoft's Beilinson attributes to a certification process "that really raises the bar"—there are still close to 4,000 applications that are compatible with Windows 2000.

"Even if an application isn't tuned and tweaked to take advantage of Windows 2000, it should in theory run faster on Windows 2000 and be more reliable on a more reliable platform," Davis says. "For a lot of companies, that'll be enough to swap out NT and go to Windows 2000."

That's good news for the IT manager of a large, national manufacturer and retailer in Baltimore.

"Right now all the [application] vendors say 'you could share a bit with us and something else,' but when a problem arises they blame the other guy," says the manager, who requested anonymity. "We'd like Windows 2000 to be a platform that lets multiple applications live together on the same server."

However, "there are no apps now that are pushing me to Windows 2000," the manager added.

With the desktop component, Windows

2000 Professional, Microsoft is promising what Windows users have long craved—an operating system that is stable, reliable, and secure. Most early reports say that goal has been achieved, but users won't know for sure until they've banded on the final product for a few months.

Microsoft hopes its System Preparation Tool will help with rollouts. The tool prepares users' images for cloning across multiple systems, through utilities such as Symantec's Norton Ghost or PowerQuest DriveImage.

"All users upgrading to Windows 2000 by necessity need to wipe and reload. It's an automated process, where we capture user data and the state of machine," says John Holmes, manager of client technology programs at Compaq, which—with 13 domains with 20,000 user accounts—boasts the largest Windows 2000 deployment to date, other than Microsoft's.

So although Microsoft wants to storm the enterprise with Windows 2000, the software giant knows that IT managers will carefully weigh implementation from all angles.

"We know customers can't just flip a switch and move to a new OS," Beilinson says. "We want to make sure they simply deploy for when they're ready for it, when they're ready for it."

For most, however, Windows 2000 isn't a question of whether to upgrade, but when.

Associate News Editor Bob Trout (bob.trout@infoworld.com) covers Microsoft and other desktop and server platforms for the InfoWorld news team.

"Hopefully, the rewards are going to be there. The rewards had better be there."

Brian Jaffe,
IT Director, New York

BUGREPORT SPECIAL: WINDOWS 2000

Bugs and fixes reported to BugNet



According to Microsoft, you should not have a fully qualified DNS computer name with more than 64 characters in Windows 2000. If you do, PEX (public key infrastructure) services will fail, which will cause failures in Enterprise Certificate Authority, domain controller and computer automatic enrollment, and IPSEC enrollment.

An upgrade "feature" that you should be aware of: During an upgrade to Windows 2000, Microsoft officials say that the default security settings you would get if you did a clean install will be applied automatically. This means that if you had tighter security prior to the upgrade, those settings are gone. If you want them back,

Microsoft says you need to reapply any custom security settings.

You should delay using EFS (Encrypting File System) on a computer that you have upgraded from Windows 95/98 to Windows 2000 until you are sure that the computer has actually joined the new Windows 2000 domain. If you don't, you may have problems with your EFS recovery and migrating private cryptographic keys.

Microsoft officials say that if you want to use Microsoft Office 95 on a Windows 2000 computer, you need to have the Office 95 Year 2000 update installed, which is at occupate.microsoft.com/download/details/095y2k.htm. Make sure that you have installed the latest patches for

all the Office applications.

If you have Microsoft Outlook 2000 installed on your Windows 95/98 computer, and then you upgrade to Windows 2000, you will have to reinstall Outlook 2000 after the upgrade. Microsoft officials say you will be warned during the upgrade process. If Outlook 2000 is in your Startup folder, it will happen automatically. They also say that the Outlook reinstallation is very slow, and the progress bar will reset a number of times. Do not cancel the installation, even if it appears the computer is locked up.

Microsoft officials say that if you are running Windows 2000 on a multi-processed computer, and if you have two or more interfaces with an APIPA

(Automatic Private Internet Protocol Addressing) address, you may end up with inconsistent routing behavior for your computer. Microsoft will have more information in its online Knowledge Base.

Special Windows 2000 Bug Report by Bugnet's Bug & Net Bruce Brown and Bruce Kozloff, who are co-authors, with InfoWorld's Brian Livingston, of Windows 2000 Secrets, published by IDG Books.

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CAREERS & MANAGEMENT

OS rollouts hinge on user training

■ No singular approach works best, but you have many options for bringing workers up to speed

By Paula Jacobs

ALL TOO OFTEN, when a company introduces new technology for its users, training is simply tacked on as an afterthought. But unless your users are properly trained first, don't expect Microsoft Windows 2000 or any other sophisticated technology to work miracles.

"The slowest part of any computer is the user," says Peter Squier, president of the ITTA (Information Technology Training Association) and senior vice president at Productivity Point International, a training company in Austin, Texas. "If you want optimal performance from your system, the best return you can get is by upgrading your user."

To that end, Mary Kay Giunta, vice president of technology training at Bank of America, in Silver Spring, Md., usually begins preparations for training on a new technology by looking for books in the library. Currently, Giunta is preparing training programs for the company's forthcoming upgrade to Windows 2000.

"Even if a rollout is months away, we like to get stocked up on self-study items for the bleeding-edge folks that are interested in beating the rush," Giunta says.

This approach, she says, provides learning resources for the technical staff responsible for rolling out and supporting the new software so that the help desk is prepared to actually help the users.

In terms of moving from its Microsoft Office 97 world to Office 2000, Bank of America prepares its employees by first offering short "Why 2000?" user seminars that cover the business benefits of migrating to a new technology and also give a quick overview of new features. Then, standard instructor-led classes are timed to coincide with the rollout.

Paul Lenk, IT director at Partners First, a credit card service company in Baltimore, is in the midst of coordinating Windows 2000 training. His responsibilities include overseeing the creation and implementation of training programs to satisfy end-user needs. Lenk emphasizes that an effective training program should include these four elements: truly understanding the end-users' needs, developing a training program to meet those needs and constraints, executing the train-

ing program with expert instructors or technology, and creating a feedback loop to assess completed training and future needs.

Lenk plans to incorporate this training philosophy to help acclimate end-users to Windows 2000, and he expects them to make an easy transition.

He believes that most of the training will be needed for those supporting the operating system, which will require that IT staff be re-trained to use, administer, manage, deploy, and support clients.

Consequently, Lenk advocates taking an inverted pyramid approach to training and then rolling out the new technology.

"Much more time will be invested in evaluating, testing, and planning for the upgrade than will take for the upgrade itself," Lenk says. "The early adopters and those [who are] too eager to deploy the upgrade will probably get burned."

As Partners First is exclusively a Windows NT Workstation and NT Server shop,

Lenk anticipates a smoother transition to Windows 2000 than for shops with Windows 9x clients.

"Active Directory [AD] forces an all-or-nothing upgrade and introduces a level of complexity that will take weeks of training to learn and implement properly," says Lenk, who plans to hold off deploying AD until later this year.

"The plan for Partners First is to slowly integrate Win2K clients into our existing NT network," says Lenk, "and decide at a later date on how we want to implement AD once our entire IT staff is trained to use this complex operating system."

Many options for training

Bank of America's Giunta always tries to round up resources first, and Partners First's Lenk is making sure that the training elements are in place far in advance of any rollouts. But with so many training options available today — classroom instruction, Web-based and computer-based training videos, and so on — what is the most appropriate solution? What is the best way to train users effectively, and what are the elements of a good training program?

Experts agree that no single approach works best. And, whether you use a classroom or multimedia approach, you can do several things to ensure that users are trained properly.

Like any IT program, a successful user training program requires careful planning. Begin by obtaining management buy-in and commitment, while explaining to users the business benefit of learning the new technology.

To prepare for training, ITTAs Squier suggests adhering to four key rules. First, make sure that management understands the importance of training. Second, provide training at exactly the same time that the technology is being implemented, not a month before or a month after the fact. Third, give users what they need according to their knowledge and background. Fourth, partition training classes by common interest area. For example, don't mix systems and marketing staff in a software migration class, because each group has its own unique learning needs.

"A good training program begins long before anybody sets foot in a classroom," says Penny Gelb, IT training manager at GTE Internetworking in Cambridge, Mass. GTE Internetworking provides an IT bod-



camp to train new hires and other users, ranging from clerical staff to managers, on proprietary in-house applications. Gelb recommends partnering with business owners and internal publicity campaigns to educate users before rolling out the technology.

Know your users

When it comes to training, one size does not fit all. Instead, be aware that different users have different learning styles and also respond differently to various delivery styles and training formats.

Whether you choose computer-based training, Web-based learning, videos, lecture classes, or informal learning will ultimately depend on user needs, background and, of course, the company's training budget.

"Creating training programs without using the input of end users means that you are flying blind," says Partners First's Lenk. "You may or may not be adding value to the organization."

Therefore, before you design a training program, determine user needs. A variety of skills assessment tools are available to help you determine these needs. Your training or human resources department can help you in this arena.

Partners First periodically works with HR to survey end-users about their training needs to determine their learning styles and preferences — whether they are best served by an instructor-led program or a computer-based training approach, for example. The IT organization has also created an electronic public forum where end-users can gather to discuss their training experiences and needs.

As a result, Partners First is able to tailor training programs to fit user needs, including specific constraints. For example, employees with busy travel schedules may prefer computer-based training, whereas others may find distance-learning — using interactive instructor-led videoconferencing, or intranet-based video streaming — more suitable for their requirements.

Key components

Although no single approach works best, an effective training program flexibly addresses user needs while incorporating sound educational methodology and curriculum design principles. Of course, paying close attention to details such as class size, quality of instruction, and course materials is also important.

Dave Murphy, founder of the International Association of Information Technology Trainers, in Elkridge, Md., prefers teaching small group seminars.

Murphy says that a class size with a maximum of eight students is just right for involving everyone without excluding anyone.

INFOWORLD COMPENSATION SURVEY

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Murphy has also found that training materials relying on pictures and hands-on exercises often more than triple student attention. Most important, however, is matching the program to required skills.

"The elements of a good training program are understanding clearly the tasks that employees will be expected to perform, and designing the training program to meet those specific needs," Murphy says. "The companies that we have watched over the last 20 years that have implemented good training programs had IT managers who understood the skills required of employees."

Whatever you do, make learning fun. "Give students a chance to play in the classroom," Murphy says.

But no matter how effectively your training program may be designed, be prepared to overcome user resistance, particularly if students are ambivalent about the technology or feel coerced into training.

In this situation, it is important to emphasize the benefits of learning the technology, and how this new technology will help the business and make it easier for employees to perform their jobs.

Murphy points out that resistance is often simply a natural response to a fear of learning something new. The fear manifests itself in the form of negative attitudes and resistance. The best solution, he says, is to listen to complaints but never, ever give in for the sake of sending consistent messages.

"When you make the statement that all employees go to training, all employees [must] go to training," Murphy says. "If you make an exception, it becomes a nightmare for the tech support department."

Measuring success

After the training program has been designed and delivered, always make sure to measure its success. To this end, both informal and formal measurement evaluations can be useful.

Watch carefully for both obvious and subtle signs to indicate employee satisfaction and training success. Do instructors actively engage students? Do employees sign on for follow-up training without management prodding them or do they complain about the training?

Whether it's Web-based or instructor-led training, ask employees to complete evaluation forms at the end of the course. Read evaluations carefully and make sure to take comments seriously.

"The feedback loop is an instrumental way to measure the success of a program or its trainer," Lenk says. Partners First uses e-mail-enabled intranet forms, storing performance evaluation data in a database.

To some degree, success is relative, and you must set realistic expectations. Some organizations may base success on the end-user's ability to use the technology, while others factor in user satisfaction with the quality of instruction. In the end, actual success of the training program relates simply to end-user perception.

"A successful program is one that has made

TRAIN GLOBALLY, LEARN LOCALLY

A large multinational company with worldwide locations, Gillette, headquartered in Boston, must provide consistent training that also accommodates local requirements. The company develops a curriculum for global usage but, for classroom training, uses local, professional instructors familiar with local audiences' needs.

The emphasis is on a diverse and flexible approach, with multiple ways to train, says Patrick Zilvitis, CIO of Gillette. "We have found that students respond very positively to something that is tailored to their needs."

One effective technique to determine student needs in instructor-led classes, says Zilvitis, has been the use of student self-assessments. After students conduct self-assessments, they break into teams. Instructors then move around between the groups to check how they are progressing through the instructional material.

In addition to the traditional classroom training, Gillette employees can take courses via the Gillette Virtual University, which the company introduced approximately a year ago.

Students log on to the Gillette Intranet Web site for course descriptions and then take classes incorporating video and audio. Approximately

400 employees are now enrolled in the program, which attracts mostly technically specific audiences for courses that range from learning Java to Windows 2000.

"Anyone, anywhere, anytime can sign on to a course and take it at their own pace," Zilvitis says.

In addition to being interactive, the Virtual University allows central tracking of progress and administration of tests, enabling students to pace their own learning.

Another successful training technique has been the use of custom coaching, which generally consists of one-on-one coaching by internal Gillette staff in an employee's office.

Custom coaching is especially popular with senior management personnel who do not have enough time to participate in traditional training, but who may need training on applications such as accessing the Gillette mail system from a remote location.

- Zilvitis recommends the following.
 - If your company is global, design your program to be global and scalable; take into account local cultural needs and tune your program accordingly.
 - Make training nonthreatening to the audience.
 - Be flexible to deal with the needs of the individual.



PATRICK ZILVITIS

GOOD TRAINER QUALITIES

What makes for good trainers and educators, and what should you consider before you set out to find your poster person?

Jane Arsham, vice president of Educational Services at Kronos, in Chelmsford, Mass., and treasurer of CEDMA (Computer Education Management Association), says, "The best trainers are those who know their audience and can communicate clearly and simply very complex thoughts to help people to do their jobs better. The ones who can do that can really make a difference."

Arsham identifies seven key qualities of effective trainers.

- They know the audience.
- They are empathetic and know how to listen without judgment.
- They are organized, prepared, and present material logically.
- They are energetic and convey excitement.
- They can modify style to accommodate students.
- They manage diversity and can flexibly adapt to students with all levels of knowledge.
- They facilitate discussion and questions.

Before delivering educational material, good trainers will assess the following: How technical

a connection with the participant, that demonstrates value to the participant, and that they can actually leave the training situation and bring back to their desk." GTE Internetworking's Gelb says. "What makes a training program successful is what makes it meaningful to the people who are there."

is the audience? What prior backgrounds do the students bring to the class? Does the class consist of managers, technical specialists, or a mix? Do students come from a variety of cross-cultural and foreign-language backgrounds?

Good trainers will quickly determine audience needs and tailor the class and materials — even midstream — to accommodate audiences representing diverse levels of knowledge, experience with a particular technology, job functions, and even English-language ability.

To be effective, trainers must demonstrate superior interpersonal and communication skills. That means answering the most trivial questions, understanding student fears, and patiently explaining assignments. Similarly, good trainers will find ways to generate excitement even about the duller technical material.

Finally, effective trainers must be superbly organized and prepared. Advance preparation will help the class flow smoothly, keep the right pace, and enable discussions to proceed logically, even as minor digressions occur. Then, when training is complete, students will be able to articulate how the class achieved its objectives.

Paula Jacobs is a frequent contributor to InfoWorld's *Careers & Management* section. She is the principal of a Massachusetts-based business communications company, and she can be reached at pjacobs@world.std.com.

IS SURVIVAL GUIDE • BOB LEWIS

Windows 2000 decisions: When do you upgrade, and what OS do you pick?

MANAGEMENT SPEAK: You've done a great job.

TRANSLATION: I don't have a clue how you performed, but I've heard no bad reports.

— Leonard R. Miller's contribution is great, don't you think?

REMEMBER WHEN every new software release was like Christmas? In the early days of the PC, when Moore's Law had a purpose other than compensating for bloated code, new releases contained wonderful new features. We looked forward to learning them and putting them to work. They made our work lives better, easier ... and, yes, more fun as well.

When was the last time you looked at a new software release that way?

Today's topic is Microsoft Windows 2000. It has, I'm sure, dozens of new features that will make our work lives better, easier, and more fun. So many, in fact, that the combined efforts of Santa Claus, the Easter Bunny, and an army of tooth fairies will be needed to carry them.



But I promised myself I'd avoid sarcasm in this column. The question is whether or not you should upgrade, not whether or not the new release rivals the marvels of old. The answer, not surprisingly, is "It depends." Look elsewhere for boldness.

There's only one circumstance in which you should bring Microsoft Windows 2000 into your company immediately, and that's if you're about to start coding software that will run on Windows in production. Whatever the hazards of early adoption, the wasted effort of converting a brand new application is worse.

Otherwise, you're in no hurry. Wait three months for a service pack, keep an eye on BugNet, and let others pave the upgrade road for you. The rest of this column is written from this future vantage point.

Now ... what are your options? One is to ignore Windows 2000 for now. Y2K remediation efforts have delayed a lot of IT projects already, and Windows 2000 is an infrastructure change, not a value-adding application. If it offers nothing you want, put your re-

sources elsewhere.

You could migrate just your desktops or make just your new desktops Windows 2000. The desktop is the most certain choice for Windows 2000. It should be nondisruptive there, and people I respect tell me it's more stable than its predecessors. Test it for compatibility with your applications, and use the desktop to get started.

I take claims of stability with a grain of salt, however, because so far I haven't heard Microsoft utter the five words it's avoided throughout the history of Windows: "We will respect our DLLs." Given Microsoft's sponsorship of the software licensing regulation, UCITA (the Uniform Computer Information Transactions Act), this promise would be empty anyway I suppose, but it would be a start. The specifications of every DLL that ships with Windows 2000 should be published and fixed ... but of course the same measure would have made every other version of Windows far more stable, and Microsoft has never taken it before, either.

Still, reports of improved stability may cause you to consider upgrading your Windows 4.x servers as well. Here, however, the question is more complicated, because Windows 2000 is for Microsoft what NetWare 4.0 was for Novell. Let me explain.

NetWare 4.0 was a radical departure from

earlier versions, largely because of NDS. A move from NetWare 3.0 looked more like a conversion than an upgrade, and many IS departments saw a conversion to Windows NT newly shipping then, as no more disruptive.

Migrating your servers from Windows 4.0 to Windows 2000 will be a thoroughly disruptive experience, as documented elsewhere in this issue. So much so that you may find it easier converting to NDS for your global directory; NetWare 5.0 or the Linux/Samba combo for file and print services; NetWare 5.0, Linux, or a commercial Unix when it comes to your intranet and your database servers (unless, of course you use Active Server Pages or SQL Server).

It's only in your application servers, with all of their custom code, that a conversion is probably far more painful than an upgrade.

Windows 2000 offers you a wonderful opportunity. By being so disruptive, it allows you to take a fresh look at a big chunk of your technical architecture (specifically, the middle of the infrastructure layer).

Who knows ... there may even be a place in there for Windows 2000.

Planning to upgrade? Or not? E-mail Bob at Bob_Lewis@compuserve.com, or join his forum on InfoWorld.com. Bob Lewis is a Minneapolis-based consultant with Perot Systems.



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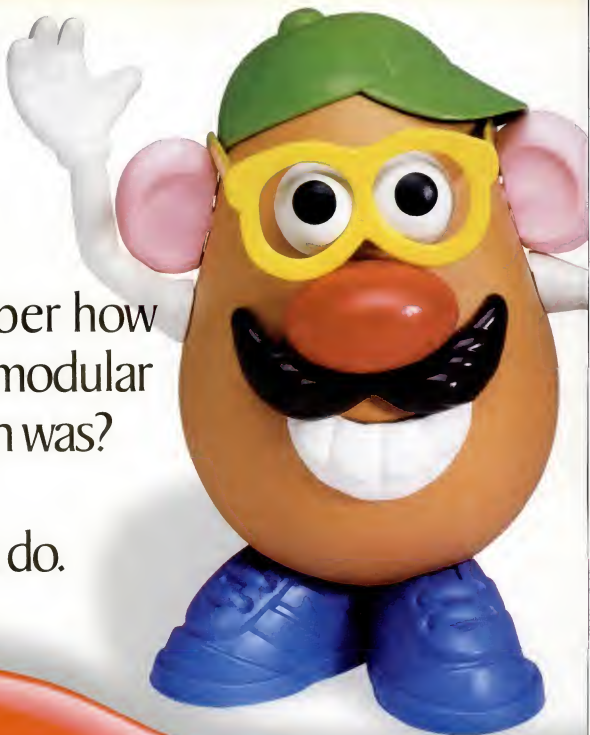


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Zhone rolls out gateway for voice

■ Device interconnects all types of user networks with carrier networks

By Margret Johnston

ZHONE Technologies, a network equipment provider founded by former executives of Ascend Communications, introduced its first product—a gateway designed to interconnect all types of networks with all local-exchange carrier's digital-voice network.

The Sector 300 Universal Voice Gateway is the first step in Zhone Technologies' strategy to address the voice demands of both carriers and service providers, Jeanette Symons, chief technology officer and vice president of engineering at Zhone Technologies, said in a press release.

Sector 300 is designed to optimize circuit, cell, or packet voice services over any existing or emerging network, including ILEC (Incumbent Local Exchange Carrier) and CLEC (competitive local exchange carrier) networks, ISP networks, and next-generation voice networks.

While Cisco Systems, Lucent



SECTOR 300 uses GR-303 signaling to act as an extension to existing voice switches.

Technologies, and Nortel Networks focus on the backbone, Zhone Technologies' plans are centered on the local loop between the central office and the customer, said Tim Donovan, a spokesman for Zhone Technologies.

"The local loop is a hodgepodge of

technologies—copper, fiber, coaxial. We want to supply technology that can take all those into consideration," Donovan said.

As consumers and commercial end-users become more sophisticated and demand more technologies, the ILECs, CLECs, and ISPs will need to find ways to supply those services and content, Zhone's Donovan said.

Service providers can deploy Sector 300 to provide voice over ATM, voice over IP, and TDM (Time Division Multiplex) voice services over any access infrastructure, Donovan said. The product interconnects ATM, IP, and TDM networks with the existing digital voice network, allowing service providers to continue using their existing infrastructures while migrating to more advanced voice services.

Sector 300 also provides a gateway to the SS7 (Signaling System 7) network, allowing service providers

to link their installed voice networks to advanced packet networks, according to Zhone Technologies.

Sector 300 uses GR-303 signaling to act as an extension to existing voice switches. It can dynamically assign up to 2,000 calls to a Class 5 local digital switch on a call-by-call basis, the company said. The gateway product also integrates traditional 3/1/0 DACS (digital access cross-control systems) functionality at the edge of the network, enhancing a service provider's existing voice network by consolidating traffic over high-speed digital interfaces.

Symons and two other former Ascend executives, Moby Ejabat and Robert Dahl, founded Zhone Technologies in September of last year.

Sector 300 will be available at the end of this month. The price for Sector 300 will be about \$50,000 depending on configuration, Donovan said.

Zhone Technologies Inc., in Oakland, Calif., can be reached at www.zhone.com.

Margret Johnston is a Washington correspondent with the *IDG News Service*, an InfoWorld affiliate.

Hong Kong moves to grant broadband licenses

By Stephen Lawson

HONG KONG OPENED up its broadband Internet service market, issuing six licenses for carriers to offer high-speed data services in competition with incumbent Cable & Wireless HKT, the government announced in a statement.

In addition to a license granted to i-Cable Communications for Internet service over its existing cable network, the government licensed five companies to provide services over fixed-wireless networks.

The government also licensed 12 carriers to offer external long-distance services over satellite, paving the way for much more aggressive competition in international telephony.

Together, the moves are expected to vastly expand the Internet service options available in Hong Kong, where fledgling Internet companies are attempting to gain a foothold in the exploding Asian Internet industry.

The providers have been offered the licenses and are expected to accept the terms of the licenses soon, according to the government's Office of the Telecommunications Authority (OFTA). The full terms and conditions of the licenses will be made public after signing, OFTA officials said.

OFTA officials said the response to its May 1999 call for fixed-wireless applications exceeded the agency's expectations. Moreover, because of applicants' hefty demands on scarce bandwidth allocated to fixed-wireless broadband, OFTA had to narrow its choice to five companies. The finalists were chosen for the quality of their applications.

Fixed-wireless licenses were issued to PSINet Hong Kong, HKNET-Telnet, Hong Kong Broadband Network, Eastar Technology, and SmarTone Mobile Communications.

The license for i-Cable, the territory's incumbent pay-TV provider, was issued following a special application by the company, according to OFTA. i-Cable plans to offer Internet access at speeds as high as 10Mbps, as well as video and possibly voice service, according to a **HONG KONG** page 68F

Safeguarding networks

Hewlett-Packard offers security software for NT enterprises

By James Nicolai

HEWLETT-PACKARD launched a new software product designed to automatically eliminate known security holes in Web server environments that are based on Microsoft's Windows NT operating system.

Typical out-of-the-box Windows NT installations contain hundreds of potential security breaches, which can be protected against by using the new software, called Praesidium WebEnforcer, HP officials said in a statement.

By fixing the vulnerabilities automatically, businesses can cut down significantly on professional IT labor costs, according to HP.

The product launch was timed to coincide with the RSA Conference, which was held last month. Microsoft also used the conference to give a first look at security features



SOFTWARE DETECTS and eliminates security holes in NT environments.

in its upcoming operating system Windows 2000, formerly code named NT 5.0.

HP also launched a subscription

service, called HP SecurityUpdate, to accompany Praesidium WebEnforcer. The service keeps IT managers up-to-date with new Windows NT vulnerabilities as they are discovered, according to HP.

As well as plugging known security holes, the software sets best security practices in NT Web server environments, monitors the integrity of security settings, and enforces those settings when unintended changes are detected, according to HP.

The software protects Windows NT Server, IIS Web Server, Transaction Server, Index Server, Script Host, Data Access Components, and Internet Explorer, HP said.

Praesidium WebEnforcer is available now and priced at \$2,995 per server. The SecurityUpdate subscription service, which includes technical support, is \$695 per year, according to HP.

HP also launched software designed to control access to a company's extranet portals and to help organizations create secure extranet applications. Called HP DomainGuard Enterprise 1.0, the software is available now; pricing depends on configuration.

More information about the RSA Conference can be reached at www.rsaconference.com. Hewlett-Packard Co., in Palo Alto, Calif., can be reached at www.hp.com.

James Nicolai is a senior U.S. correspondent with the *IDG News Service*, an InfoWorld affiliate.

Xircom rounds out global presence with Latin American push

By Juan Carlos Perez

XIRCOM, WHICH LAUNCHED a Latin America operation in mid-1998, expects its revenue in the region to grow at an annual clip of 25 percent to 30 percent, according to company officials.

Xircom, a maker of products for connecting mobile computing devices to networks, opened a Latin America sales office in St. Petersburg, Fla., in August 1998, said Nancy Mayeux, Xircom's senior channel executive for Latin America, in a recent interview. The

vendor also assigned full-time technical support and marketing personnel for the region at the company's headquarters in Thousand Oaks, Calif., she added.

Currently, between 3 and 5 percent of Xircom's sales in the Americas come from Latin

America, said Kevin Paolino, Xircom's director of sales for the Americas, a region that includes Canada and the U.S.

"We were selling to Latin America before August 1998, but more by accident than on purpose," Paolino said, adding that this unfocused approach "probably did damage to the brand."

In addition to putting together a team of staffers devoted to sales, marketing, and support for the region, Xircom has also set up a distribution strategy for Latin America, Mayeux said.

The company currently has in-country distributors in several Latin American markets, including the three largest, Brazil, Mexico, and Argentina, Mayeux said. Xircom also has three distributors in Miami to serve countries where the vendor doesn't yet have local distributors. In Mexico and Brazil alone, Xircom has about 600 resellers, she added.

Xircom's products include the RealPort family of PC cards and the PortStation port expansion system.

Xircom, in Thousand Oaks, Calif., can be reached at www.xircom.com.

Juan Carlos Perez is the Latin America news editor for the IDG News Service, an InfoWorld affiliate.

Online success

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Intel says new adapters to give LAN security a boost

By James Niccolai

INTEL HAS RELEASED two network adapters designed to improve the performance of PCs and servers that exchange encrypted information over local area networks.

The adapters feature a co-processor that off-loads the job of encrypting and decrypting data from a PC's main processor. That should mean better performance for users who send and receive encrypted files over a LAN, said Tim Dunn, a manager with Intel's LAN Access Operation unit.

As more companies use the Internet and other networks to do business, the need to encrypt sensitive data becomes greater, Dunn said. While firewalls provide some protection against external attacks, most security breaches originate inside networks, he said, citing studies from the U.S. Federal Bureau of Investigation and others.

The new adapters take advantage of security features in Microsoft's forthcoming Windows 2000 operating system, particularly its support for the security standard IPsec (Internet Protocol Security), Dunn said.

"One of the key things we're trying to do here is make security transparent to the end-

► INTEL page 68D

Charles Schwab

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VP of Web Systems,
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Brazilians to get free Internet service from Telefonica

By Juan Carlos Perez

HERE'S ANOTHER REASON for Brazilians to party with abandon at Rio de Janeiro's next carnival: one of the region's largest ISPs will offer free Internet access in Brazil.

Terra Networks, a subsidiary of Spain's Tele-

fonica, announced that it plans to offer free Internet access in Latin America's largest country and largest economy beginning this month.

Terra Live, as the free service is called, was launched first in Sao Paulo and will be rolled out to other cities later this year, the company

announced. The service includes unlimited Internet access, one e-mail account, and 10MB of Web-site space.

The company hopes the free service will significantly increase the number of Internet users in Brazil and as a result, the number of visitors

to its Brazilian portal, located at www.terra.com.br. More users will generate more advertising revenue and more e-commerce activity at the portal, the company said.

Along with the new free service, Terra also announced that it is reducing by almost 50 percent the monthly fee for its paid Internet access service.

The paid access service has more features than the free service, such as unlimited e-mail addresses, roaming services in and over 2,000 cities inside and outside Brazil, 50MB Web-site space, and messaging, agenda, and chat services, the

company said.

Terra is not alone in offering free Internet access in Latin America. Earlier this year, iFX announced free Internet access for several countries in the region.

Other companies are already offering free Internet access. Libertis.net, which launched its service in December in Mexico City, already has about 10,000 users, a company official recently told the IDG News Service. Libertis plans to expand to two other Mexican cities this month and abroad to Brazil, Argentina, and Chile before mid-year, according to Adrian De Lope Friedeberg, the company's president and chief executive officer.

It is estimated that about half of all Internet users in Latin America are in Brazil. Although online population estimates for Latin America vary, a study released in November by Jupiter Communications puts the total at about nine million users. Still, high costs are keeping many from getting on the information superhighway — only two percent of the region's population is online, according to Jupiter.

A study issued in July 1999 by the Boston
> FREE NET page 68f



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Intel

Continued from page 68B

user," Dunn said.

An Intel executive showcased the adapters running in computers from Dell, Hewlett-Packard, IBM, and Compaq at the RSA Conference on security in San Jose, Calif.

The PRO/100 S Management Adapter is priced at \$112 — about \$15 more than Intel's existing network adapter without the encryption co-processor. Dunn said. The PRO/100 S Server Adapter is priced at \$139.

At the RSA Conference, the Intel executive also announced that Intel's forthcoming Itanium processor has been optimized to work with the SSL (Secure Sockets Layer) encryption standard. Itanium's instructions have been written in such a way that they make lighter work of algorithms used in SSL software from RSA Security, Dunn said.

Intel Corp., in Santa Clara, Calif., can be reached at www.intel.com. Information about the RSA Conference can be reached at www.rsaconference.com.

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Hong Kong

Continued from page 68A

company official. It will begin services in the first quarter of this year, the official said.

A statement by City Telecom, parent company of Hong Kong Broadband Network, said the company would introduce its ser-

vices next month. Offerings will include basic Internet access, basic voice telephony, video conferencing, television, and other multimedia services. It will offer its services at 30 percent less than the cost of HKT's services, the statement said.

HKNet-Telnet, a joint venture among Internet service provider HKNet Hong Kong, Mainland carrier CCT Telecom, and U.S. wireless technology company Telnet, will

offer a range of services at speeds as high as 5Mbps. Offerings will include video, meetings, Web access, and e-mail, according to a company statement.

One observer said a competitive broadband market could help make Hong Kong a hotbed of Internet development.

"Hong Kong, of all the places in Asia, knows how to respond to competition, and the Internet industry benefits by it," said Den-

nis Philbin, managing director at research firm International Data Corp. Asia-Pacific, in Singapore.

"Superior infrastructure benefits Internet start-ups, and with broadband becoming less expensive, it's certainly going to be a stimulant," Philbin said.

The competition is likely to give Hong Kong an edge over Singapore, for example where high-speed services are well developed but little competition exists, leading to higher bandwidth prices, Philbin said.

External satellite telecom licenses were offered to several telcos: Hutchison Telecom

"Superior infrastructure benefits Internet start-ups, and with broadband becoming less expensive, it's certainly going to be a stimulant."

— Dennis Philbin
International Data Corp. Asia-Pacific

munications Technology Investment, NTT Com Asia, Pacific Century Matrix, PSINet Hong Kong, Teleglobe Hong Kong, China Digital SatNet, Asia Satellite Telecommunications, CTI International, Million Point Technology, Far East Gateway, Galaxy Satellite Broadcasting, and SmartOne Mobile Communications.

According to OFTA, the external services will expand Hong Kong's external communications capacity by 3Gbps.

Office of the Telecommunications Authority, in Hong Kong, can be reached at www.ofta.gov.hk. PSINet Inc., in Hong Kong, can be reached at www.psinet.com.

Stephen Lawson is an Asian correspondent for the IDG News Service, an InfoWorld affiliate.

Free Net

Continued from page 68D

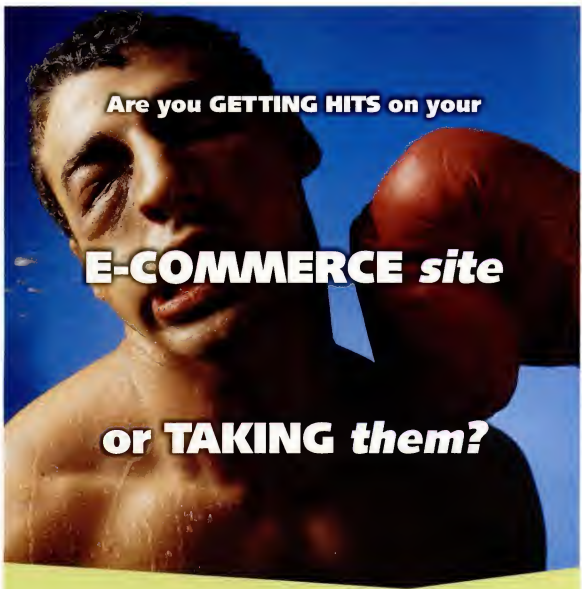
Consulting Group (BCG) states that the monthly cost of accessing the Internet in Latin America for a user who logs on for 20 hours per week is \$54 in Mexico, \$83 in Brazil and \$112 in Argentina. That estimate factors in Internet access subscription costs, PC ownership costs and phone charges. BCG put the cost in the U.S. at \$42 per month.

"There is no doubt. Free access is the up coming trend," said Marcelo Lacerda, director of Terra's Brazilian subsidiary, in a statement.

Terra offers Internet access service in Spain, Brazil, Mexico, Chile, Peru, Guatemala, and the U.S. to 1.14 million customers, according to the company. Its various portals draw a total of 3.3 million users per month, according to Terra.

Terra Networks SA, in Brazil, can be reached at www.terra.com.br.

Juan Carlos Perez is the Latin America news editor for the IDG News Service, an InfoWorld affiliate.



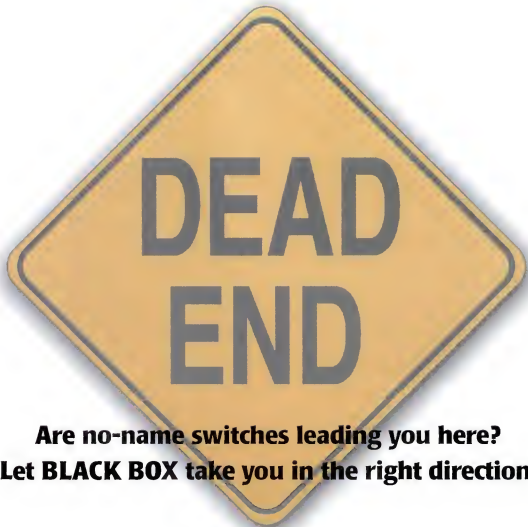
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2000 and beyond

Now that Y2K concerns are a thing of the past, it's time to start thinking about your I-commerce agenda for the coming year. Is your company planning to build an I-commerce site this year? If you already have a site, what projects are slated to expand its capabilities? Let us know by joining our online forum, hosted by the Intranets & I-Commerce team.

E-BUSINESS TREND WATCH

E-businesses use bots to boost customer service

InfoWorld Reporter Ephraim Schwartz investigates Artificial Intelligence, a software company that develops smart bots for e-businesses. To what extent can these bots increase the quality of customer service and fuel customer loyalty? Turn to InfoWorld's Page One at www.infoworld.com to see his feature article.

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TALK BACK

To contact Enterprise Computing staff writers, send e-mail to firstname.lastname@infoworld.com.

Web publishing software

Put an intranet in your pocket

AvantGo Enterprise tools serve Web content, applications to road warriors

By Mike Heck,
For InfoWorld Test Center

ANY CORPORATIONS NOW consider handheld devices the standard link between enterprise data and mobile users. But supporting these devices, including making sure their users have access to the corporate data they need, places an extra burden on IT staffs. Furthermore, this burden will increase as more handhelds find their way into the enterprise in the coming years. How can you extend corporate data to mobile users while keeping support costs to a minimum?

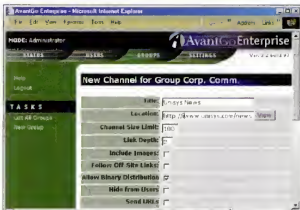
AvantGo's Enterprise solutions — Enterprise Publisher 1.0 and Enterprise Interactive 3.2 — present efficient, low-overhead options for delivering corporate information to Palm devices and Windows CE units, offering large organizations a high return on investment. Enterprise Publisher is a new client/server product for deploying intranet and Web content to handheld users. Enterprise Interactive, an updated and renamed version of AvantGo's Enterprise 3 client/server software, goes beyond Enterprise Publisher to support two-way communications between handhelds and back-end databases or applications.

Both solutions allow mobile professionals to access corporate information or applications via a familiar Web browser interface while providing IT groups with a straightforward and centralized way to administer that access. Sure to be a hit with users and administrators alike, AvantGo's Enterprise software earned an overall score of very good. (In the interest of full disclosure, I should point out that InfoWorld is among the AvantGo.com content providers.)

On the go

Both versions of AvantGo Enterprise use the same server kernel. Therefore, Publisher gives you a cost-effective way to start distributing corporate reference material. Later, when you want to tie handheld users into corporate databases, you can quickly upgrade the Publisher server to Interactive without redoing any configuration settings.

Setting up the Publisher server under Windows NT required little



ADMINISTERING content channels and user accounts in AvantGo Enterprise Publisher or Interactive is easy via a Web interface.

technical know-how and about five minutes of time. The installer automatically created the SQL database and connections (for user data). Additionally, the software recognized my Windows NT domain server and users so I didn't have to create a new set of accounts.

The concept behind serving information channels (Web pages residing on internal or external Web servers) to handheld users is simple. Using a browser interface, I defined which pages each group or individual would receive when they synchronized their Palm or WinCE devices with my AvantGo server. The final steps involved loading the AvantGo browser application on each handheld, specifying the AvantGo server name, and performing a synchronization.

In this test, I easily set a customized set of internal news stories, pricing updates, and organization announcements to each handheld user. Furthermore, I configured my server so various co-workers were automatically subscribed to different industry news and financial channels available on the Internet. Users can also subscribe to outside channels directly using AvantGo's free service, AvantGo.com.

For enterprises, Publisher's advantage is that, from one spot, administrators can specify content and who receives each channel. The server does the rest, such as ensuring that updated files replace outdated material at the next synchronization. Moreover, I found data

very compressed on the handheld — a few hundred Web pages consumed just 150KB of memory.

Get interactive

AvantGo Enterprise Publisher is an efficient way to get Web content to mobile users. But I think many organizations will want to consider Enterprise Interactive because it lets you deploy applications such as sales automation and inventory tracking. Earlier versions of Enterprise were able to handle database requests and other input from handheld users

through HTML forms. Version 3.2 adds two very important features: SSL (Secure Sockets Layer) encryption (for secure transactions) and JavaScript support.

To evaluate these enhancements, I deployed various Web pages that calculated JavaScript to perform calculations, error checking, and other standard functions. On both a Palm OS-based handheld (a Palm V) and a Windows CE-based unit (a Hewlett-Packard Jornada 680), my JavaScript pages worked as designed. And I successfully exchanged data with a secure database using SSL encryption.

AvantGo's Enterprise software is a very good choice for any organization needing to extend its intranet or business applications to handheld users. To the system's existing functions, such as multiple online and offline connectivity options, Enterprise Interactive 3.2 adds better security and improved APIs and JavaScript for developers. The economical entry-level version, Enterprise Publisher 1.0, is a good alternative if you need only one-way content delivery.

Mike Heck (mike_heck@infoworld.com) is a contributing editor and manager of electronic promotions at Unisys Corp., in Blue Bell, Pa.

THE BOTTOM LINE

AvantGo Enterprise Publisher 1.0 and AvantGo Enterprise Interactive 3.2

BUSINESS CASE
AvantGo Enterprise reduces the total cost of ownership of handhelds in the enterprise through centralized management of mobile data, applications, users, and devices. A single server supports thousands of users, reducing hardware costs.

TECHNOLOGY CASE
AvantGo Enterprise Publisher is an efficient means of deploying intranet content to handheld devices. Enterprise Interactive adds two-way communications between handhelds and back-end databases, as well as SSL security and JavaScript support.

- PROS**
- Provides simple, Web-based administration
 - Features high-performance, multithreaded server design
 - Offers 56-bit or 128-bit SSL encryption
 - Supports HTML forms plus JavaScript
 - Provides APIs that allow developers to connect to back-end databases
- CONS**
- None significant

COST
Publisher: \$75 per user
Interactive: \$150 per user

PLATFORMS
Servers: Windows NT 4.0 and Microsoft Windows 2000; Linux (Kernel 2.0); Sun Solaris 2.5.1, 2.6, and 2.7

AvantGo Inc., San Mateo, Calif.
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► Web application server

Build your e-business now, customize later

■ Allure 2000 delivers powerful prefabricated Web applications

By Patrick Marshall,
For InfoWorld Test Center

ON THE WEB, as in the rest of the business world, time is money. Every day that your Web site sits idle on the developer's computer, you're losing dollars. If you want to get your Web site up quickly and with minimum effort, consider Commence's Allure 2000.

Allure 2000 makes it easy to get powerful, interactive Web applications up and running quickly. It delivers a prefabricated Web site complete with 18 interactive applications designed primarily for small to midsize companies. But although the software is very easy to set up, it does carry limitations that will exclude it from consideration by some companies. As a result, I awarded Allure 2000 an overall score of good.

One catch is that the program currently works only with Commence 2000 databases. Because Allure 2000's Web applications are automatically linked to your Commence

2000 database, you can avoid the usual development time and expenses associated with connecting Web applications to back-end databases. But if your shop isn't already using Commence 2000, you'll have to factor this additional cost into your overall bill.

Another limitation is that Commence 2000 scales to only a few hundred users, not to the several thousand of an enterprise-level database such as Microsoft's SQL Server. According to Commence officials, a version of Allure 2000 will be released soon that will work with any SQL database.

Finally, while Allure 2000 does give users control over customizing the Web site, it doesn't offer the full range of Web development and production workflow tools that you'll find in products such as Allaire's Cold Fusion. If you want more customization than is supported by Allure's toolset, you'll need to turn to third-party development tools.

Nevertheless, if the database and scalability limitations don't deter you, you'll be sur-

prised by how quick and easy it is to get Allure 2000 fully functional. For a start, I found installing the program to be a snap. Following the default setup routine, it took me only a couple of hours to get my new, interactive Web site up and running.

Because I didn't already have a corporate Web site running, I used Allure 2000's default site and customized the interface using the Allure 2000 desktop application. For example, the program allowed me to change logo images, page titles, and much of the data that is displayed on pages directly at the desktop without having to do any coding or script writing. If you want to go further with site customization, bear in mind that you'll need to know how to edit Internet Connector scripts and HTML template files.

Thanks to Allure's redesigned applications, you don't have to get your hands dirty with coding to allow your visitors to view custom pages of products, enter data in forms, or ask for a callback. The 18 pre-designed applications include a product catalog, company literature, order tracking, product registration, a knowledge base, and FAQ and mailing lists. Internal corporate users define and manage site content using a desktop application that offers a navigable Microsoft Outlook-like interface, with tabs in a panel on the left for accessing the program's primary views: in-basket, customer data, product data, and workflow group.

The in-basket contains items submitted by Web visitors and others in the internal workflow group. The customer view offers some of the same data grouped according to the customer who submitted each item. The products view displays information from the Allure database on your company's products.

THE BOTTOM LINE

Allure 2000



BUSINESS CASE

Allure 2000 will save businesses money primarily through its low-cost implementation. Thanks to its pre-designed applications, Web sites are very quick to set up, requiring no help from developers unless you want extensive customization.

TECHNOLOGY CASE

More than a Web server, Allure 2000 includes 18 pre-designed, customizable Web applications for conducting business. Its main drawback is that it requires a proprietary back-end database.

PROS

- Easy to install and configure
- Customizable applications
- Provides workflow tools

CONS

- Requires proprietary database
- Limited built-in development tools

COST

\$6,995 per server

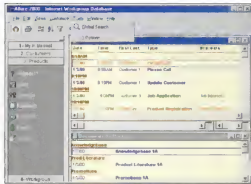
PLATFORMS

Windows NT 4.x, Microsoft Windows 95/98, Windows 2000

Commence Corp., Oakhurst, N.J.

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ALLURE 2000'S Windows-based desktop application makes it easy to track customer inquiries and other activity.

Finally, the workflow group view displays the employee directory, calendar, and to-do list employed by the internal workflow group.

You can use the Allure 2000 desktop application to add data, such as product information or customer records, to your database. Also, you can specify that when Web visitors submit specified types of forms — job applications, feedback, product orders, and so on — the forms will be routed directly to specified workflow members. But customizing the structure of the underlying database, including creating custom data fields and assigning properties, is accomplished via the Commence 2000 application rather than via Allure 2000.

Overall, I found the Allure 2000 desktop application to be generally well-designed and easy to navigate. I did find, however, that it's all too easy to get lost in the clutter of pop-up windows, from employee directories to task lists and calendars.

Furthermore, system administrators should take note that Allure 2000 relies primarily on the OS for security. That means that if you install Allure on Windows NT systems using the NTFS (NT File System), you can take advantage of NT's directory and file security controls. However, these controls are not available when running the site on Windows 95/98.

Allure 2000 is best suited for small and midsize businesses without the resources necessary for developing an interactive Web site in-house. Although Allure 2000's customizable applications can be set up and running in one day or less, the solution works only with Commence 2000 databases and lacks a complete set of development tools — limitations that let me to give this otherwise very good product a score of good. If these limitations aren't a problem Allure 2000 offers an inexpensive and attractive solution for moving your business quickly to the Web. Alternatively, if you don't want the hassle of hosting your own site at all, you can subscribe to Commence's hosting service for \$495 per month.

Patrick Marshall (pgmarshall@uswest.net) is an InfoWorld contributing editor and reviews editor at Federal Computer Week.

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Agribusiness provides fertile ground for DirectAg

By Ephraim Schwartz

ALTHOUGH THERE may be fewer than a quarter-million major producers (they used to be called farmers) in the United States, the agricultural business is a \$65 billion market that is

attracting Web start-ups such as DirectAg.

Kip Pendleton, founder, CEO, and president of the St. Paul, Minn.-based company, originally in-

vented DirectAg.com to be a virtual seed store where farmers could compare prices, shop for, and purchase seed online. Traditionally, farmers deal with multiple salespeople and companies, none of them integrated into a single system, Pendleton says.

"As we talked to customers, we discovered the level of service a farmer receives is aligned around a rarer or product," Pendleton says. They had 10 companies calling on them and bought from five."

As DirectAg moved toward its August launch date, however, it became evident that the same producers who were buying seed needed other items, as well.

So the site expanded to include such areas: seed, animal health, crop protection, machinery/parts, technology, and financial services.

"The same producer concerned with what he is feeding his cows

also wants to know how to keep them healthy," Pendleton notes.

Today the site offers a wide spectrum of content, from news out of Washington to local news, as well as more science, health, and technology information.

And because farming is supported by a \$140 billion financial services industry, DirectAg quickly allied itself with Soris Financial. Not only are producers now able to buy most agricultural products online at DirectAg.com, they can also finance their purchases "on account," with approval taking as little time as 60 seconds, according to Pendleton.

Knowing how location and climate affect the needs of producers are two essential components in addressing DirectAg's customers. The site is organized around producers' ZIP codes to deliver product information and the appropriate news down to the ZIP-code level.

"We are not only talking about products in one ZIP code, but six [buying] communities in one ZIP code," Pendleton says. "In seed alone we learned that there could possibly be 1,000 products, so we had to design ways to offer information to the local area."

Setting up an integrated system that can look across multiple product lines and manufacturers is find

the products and services available in a farmer's specific location required custom Java software and database development, according to Pendleton.

The custom Java program was developed from the ground up because nothing existed that could find the right hybrid seed for a particular geography from multiple seed manufacturers. The Java program contains all the business rules and eventually interfaces with an Informix database.

However, once the customization work was done, it became a simple matter to scale up DirectAg's offerings to deliver additional content such as local news and management information.

Currently DirectAg uses Sun's Vignette Story server to deliver content. The front end — the online catalog and front page of the newspaper — is created by Imagine Studios in Minneapolis and runs on top of Oracle, according to Pendleton.



KIP PENDLETON expanded DirectAg from a virtual seed store to an inclusive source of agricultural information and financial services.

However, Javelin Technologies — also in Minneapolis — which hosts the site and handles the payment and transactions, uses Informix.

"With our speed to market, we compromised by doing it on two databases. It wasn't ideal, but [we got] to market in the fastest manner," Pendleton says.

As the site's customer base and services increase, Pendleton says he is considering a platform change.

"Our original platform was targeted at seed for North America," Pendleton says.

DirectAg's customer base now goes well beyond seed, and "no one really knows the producers' total needs and desires," Pendleton says.

To better determine those needs, the company is looking at perceptual software from companies such as Net-Perceptions that will track the interests and buying patterns of visitors to the site so DirectAg can suggest products and services of interest.

"Perceptual software will allow us to do this, providing [added] value to companies and farmers," Pendleton says.

NET PROPHET · SEAN M. DUGAN

The cure for all your e-commerce woes: The new, improved spin-off dot-com companies

INTERNET STRATEGY got you down? Confused about how your company can adopt the 'can do' attitude of dot-coms? Wracked by personnel problems? Channel conflict and cannibalization keeping you up at night? Fear not! There's a magical bullet: Just spin off your 1-commerce units!

Oh, there might be a few naysayers — those with the temerity to suggest that spinning off the unit might be an unwise move. Ignore them — fire them, if you can. This is the Internet: Common sense and good judgment have no place in the "dotconomy."

The beauty of spinning off an 1-commerce e-business unit is that investors are — how can I express this politely? — quite clearly in. Take your e-business division, make it an independent company, and voila! An in-

stant billion-dollar valuation. Add millions to the capitalization of your company with the stroke of a pen. I mean, after all, it's guaranteed that investors flock to dot-coms, right? And the burn rate, oh, the burn rate, nobody cares if Amazon.com wouldn't know a profit if Jeff Bezos ran over it. It worked for him, why not you? But there's more!

If only the dinosaurs had been able to give birth to quick-footed mammals. Well, you can. Maybe you want to spin off your Internet business to make it more agile. You have to be nimble and quick to compete with those little dot-coms. All that time spent in strategy meetings and creating Microsoft PowerPoint slides will pay off big-time in making a nimble spin-off.

You have the people who'll run your spin-off, the entrepreneurial talent, right? The kind of people who thrive on creating something out of nothing? After all, that's why they came to work for your large company in the first place — they're born entrepreneurs. So, you've got a killer management team, ready to dive into the wild and woolly waters of an Internet start-up.

And then there's the unquestioned support of your company's higher-ups. They're so hip and savvy to how the Internet is re-shaping

the market landscape of their core business.

With a group like that, your spin-off is sure to be a success. This is the group that would never consider hobbling the spin-off to protect the parent business and prevent channel conflict. Not in your company. Paralyzing arguments over who's P&L statement reflects the costs of the start-up? Not here! Management politics — that would never enter the decision when everyone is struggling with the spin-off cannibalizing the corporate parent. And just because you can create a dot-com that cannibalizes your business doesn't mean your rivals or some pipsqueak starting with \$30 million in venture capital money can do the same thing.

Then there are the personnel issues. It's so much simpler to hire red-hot talent when you can say they'll be for working for Megacorp.com, rather than stuffy old Megacorp. And you don't risk alienating the talents of Megacorp when you flash stock options and perks in the faces of the dot-commers. Rather than trying to fix your compensation problems and deal with tough personnel issues, isn't it better to just sweep them under the rug? It's not like the allure of options, good salaries, perks, and being on the cutting edge will make your

best and brightest jump ship from the parent company.

Those troublemakers who say you're selling out your company's future by removing its Internet capability, well, you know what to do with them — transfers to Nome, Alaska.

Why worry about the fact that you've effectively put your company's future in the hands of another company? Either you control the board and most of the stock — see the part above about how management won't cripple the business — or you've completely spun it off. No, you haven't essentially birthed a competitor to your business, because you have some stake in it, right? It'll be simple to buy back the company when it's a huge success and its stock value reflects that.

At the end of day, doesn't a spin-off make a lot more sense than having firm, dedicated leadership in your parent company, the kind of leadership that will make tough decisions and do what's necessary to restructure the business to address the changing business landscape?

Why address fundamental business model issues, which takes time and energy, when you can slap a Band-Aid on it?

Sean M. Dugan is a senior research editor at InfoWorld.



TEST CENTER RX • BROOKS TALLEY & LORI MITCHELL

Taking over a poorly managed network requires that you set standards, policies

I've recently been promoted to network manager at a medium-sized company (of 350 employees). The fellow before me was a good guy, but he was very lenient and loose with the network and network management policies. At this point we have IP, IPX, and NetBeui running, and lots of people are sharing drives in our one huge workgroup. People frequently share files from each other's systems. I'm concerned because I don't know where many of our important files are. I think people should be storing their material on our file servers, which are backed up. We don't back up client workstations. Also, we have many different versions of Netscape and [Microsoft] Internet Explorer, and the tier-1 help desk people are going nuts. I'd like to standardize on one protocol and one browser. How can I get this under control, please?

E. Thompson

Brooks: Well, congratulations on the promotion. It sounds like you've got your work cut out for you. I know you don't want to hear this, but you are never, ever going to have your network completely under control. It can be improved, of course, and I agree that you've got some problems there; but if you're looking for perfection, you'll be disappointed.

You've got three main problems. As my boss, the esteemed Laura Wonnacott, would say, "people, process, and technology." The technology is always easiest to deal with, so I'd say start by eliminating IPX and NetBeui from your network. This will mean a visit to each client machine, which is no fun, but it's the only way to go. This should greatly reduce support calls.

Next, you're going to have to decide what to do about this workgroup thing. My advice is to send out polite notes, letting people know why it's a bad idea. Nobody wants to be told "you're not allowed to do this." If you make it clear that in the event of a workstation crash only documents stored on the file servers will be recoverable, people will probably adjust their behavior.

Likewise with Netscape and Internet

Explorer. I'd suggest picking one "recommended" browser and version, making it readily available, and encouraging people to switch to it. If that doesn't work, you might consider more draconian measures. But be careful; people can get religious about this issue.

Lori: Congratulations on your new position. It is definitely a time-consuming and potentially stressful job you have just inherited. You have a big task in ironing out these issues, so take them one step at a time.

One of the first things I would suggest is to define your protocol support, shared server allocation, and client support. You should discard NetBeui and perhaps you can drop IPX. It is essential to have your users place important files on a shared server. But before you get your users to comply, you should put a policy in place for what is supported. Get upper management involved to help address these issues. Decide what servers will be available for sharing files, what space will be allocated for each user, and what types of files can and should reside there. Servers can fill up fast if users think they can store anything.

Clients should be responsible for backing up their own workstations; nonetheless, there

are products, such as ArcServe, that also back up workstations. To relieve your help desk you'll need a software support policy. Of course, there are often exceptions to the rule, but if users know that they will get support only for listed products, your help desk staff may be able to breathe between calls.

Depending on your specific environment and what clients you must support, some changes can become complicated. To select a Web browser for a mixed environment, would suggest using an open-standard browser such as Netscape or Opera. If you're a Microsoft Windows-centric organization or you are planning to migrate to Windows 2000, then I would suggest Internet Explorer.

Standardizing on software is always daunting. You may want to consider a software distribution package, from which clients can get required and supported software, as well as automatic installation on their machines.

Define a policy, get management behind it, and tell the employees what this means for them. They'll enjoy better service.

Brooks Talley is senior business and technology architect for InfoWorld.com. Lori Mitchell is a senior analyst for the Test Center. Send your questions for the Test Center to testcenter_rx@infoworld.com.

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Will Corel bring Linux to more desktops?

These edited excerpts from *InfoWorld.com's* forums provide a sample of the lively debate that takes place there. For the full discussions, go to www.infoworld.com and click on the forums button.

Will Corel's GraphOn strategy be a success?

"While running [Microsoft] Windows applications on GNU/Linux may help users' transitions, the appearance of [Corel's] GraphOn [technology] does not change the situation much. Similar technologies already exist, such as VMware, Wine, VNC [Virtual Network Computing], etc."

"It could help, but if you're a heavy Windows user, I wonder how well it works. I wonder how well AutoCAD Inventor would work under it. It's still important to have more Linux productivity applications. But these various technologies (including Tarantalla, VNC, etc.) certainly won't hurt the spread of Linux."

"This is similar to what IBM wanted to do with OS/2: Build a better platform, provide a legacy emulation option, and people will supposedly move their current applications over to the new, improved platform: standardize on the new platform; and finally decide to use new applications written for the new platform. This strategy did not work for IBM, and it will not work for Linux. The key to Linux success will be to have developers write superior applications that run only on Linux. I know this is not the Linux mentality, but it is the way to build a strong OS franchise."

What should government's technology role be?

"The government does not need to advocate technology. It is in the best interest of industry to push itself, and it is doing so. Ensuring privacy is a joke. If we passed restrictive legislation, the existing snobs would probably get 'grandfather' status. And any money-making concern that can afford a politician or two can get around laws."

"Government could further remove restrictions on encryption. We have taken a partial step in the right direction recently but need to take the full step."

Is Sun on the path to freedom with Solaris 8?

"The [Sun Solaris 8] source code isn't nearly as 'free' as software under General Public License. It's not trying to be. It's aimed at [paid] developers. Sun [Microsystems] has always been selling to businesses, not consumers, so this isn't surprising. I think it's worth pointing out that Sun has never been particularly anal about access to the source code — if you're at university, the source has been available for quite some time, though not for commercial development. If you're an important customer, you could probably get access, too."

"In some ways, the source-code access for Solaris 8 isn't that far removed from what was previously available. The big difference now is that anybody who is interested will be able to get the source and with little trouble."

reasons.

First, most of the packages are either too complex for "true" end-users to feel comfortable with for even simple report creation. This is generally true because the vendors feel a need to include every feature possible leading to a complex working environment. The result is a package suitable for operations, research, or business analyst staff but not for field sales or senior management.

Another problem area is that the include data sources provided for nontechnical end users (i.e. from data warehouses, etc.) are usually completely; for example, sales forecasts from field representatives might not be included in the system.

This necessitates jobs, processing, etc. beyond the end-user's skill level to assemble the data needed. They will try but the result will typically be a kludge of semi-manual steps, not a robust data-processing environment.

The frequent result is wondering on Tuesday why you can't get back to the numbers reported last Friday.

I also often see departmental or divisional data reports and data warehouses, which have been assembled by IT staff but don't include either all necessary data elements or recent (and necessary) organizational changes. An changes would require an effort by IT which is now focused on other higher priority projects.

While many of these tools do provide connectivity methods to external data sources that is just the beginning. There is most likely much work to do identifying and dealing with missing data, data type mismatches, corrupt data, not to mention proper data interpretation ("sales" is not necessarily what you think), secondary processing requirements, etc.

There is also an element of user apathy at work here. The person willing and able to fully utilize such reporting tools may spend far more time than desired getting to the "perfect report" rather than an effective but perhaps less flashy communication.

The fact that you can load up reports with colors, graphics, and clever processing tricks does not mean you should. And the resource such as network bandwidth, color printing, and copiers, production time, etc. tied up producing the result of such reports is very real.

That person probably does not do a good job of turning such a process into a procedure, so each month significant personal effort is needed to produce routine report. And when he or she leaves the company, the process starts over.

What's missing here is a robust data environment all the way to the end-user's desktop containing all necessary information, a capable and truly easy-to-use analysis capability which is usable by senior management or nontechnical staff, and an ability to automate creation of sets of specific report information. The tools are too general to truly meet such needs.

John Ehler
Riverside, Calif.

Y2K spending too high?

THIS WHOLE THING about people saying that Y2K work is a useless expense reminds me of what's happened to the network I have been rented out to manage (see "Dixie 15 spent too much on Y2K bug fix" Jan. 10, page 1)



TO THE EDITOR

Religion and politics in IT

OH, MICHAEL VIZARD is so right (see From the Editor in Chief, Jan. 17, page 30).

So many people in the world of technology feel that the products, techniques, or philosophies that they espouse are the one and only way to True Technological Utopia!

I would like to expound on one of your points, though. I believe that people use the wrong technology or product in a given situation not because of some irrational zealotry, but because it's what they know the best, and even then, they may not know it all that well.

Many of us give the wrong answers to technology questions, because we focus entirely on what we know and are most familiar with.

We've got to recognize the limitations of what we keep in our own personal toolboxes and be aware of what else is out there.

No, we can't be experts in everything, but we should have enough familiarity with an entire genre, and beyond our own expertise, to know when to say, "You should use something else, and someone else is going to have to do it, because I don't know it well enough."

That seems to take a bit of courage, but I think that there's enough work out there in every category to keep all of us employed in our respective skill areas for the rest of our lives. Which is not to say that we shouldn't constantly seek to improve and expand our skills.

Well done on another excellent installment of an excellent column in an excellent publication. Cheers!

Boyd D. Garrett Sr.
Sterling, Va.

Enterprise reporting

I READ "Putting the power back in reports" in the Jan. 24 issue of *InfoWorld*, page 69.

My experience is that "Enterprise" reporting solutions are not the final solution, especially for field organizations, for several

INFOCRYPTION

This week we've taken a quotation from a film critic, actor, and essayist popular in the first half of the 20th century and encrypted it using a simple substitution cipher in which each letter of the alphabet has been replaced by another.

Short words, punctuation marks, character frequency, and plain-old luck should help you unlock the meaning in the message.

WYRUYP KWY OU WYR

WDUNYS UJ LUIB GIUHEOPO

ES ETY'S SZP LUIB IP ET

TNGGUTPO SU QP OUEYF WS SZWS

DUDPYS. — IUQPIS QPYKZCPR

In addition, here's a hint:
In this week's *InfoCryption*

R = Y

Answer can be found on the
InfoWorld Web site at
www.infoworld.com/printlinks.





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Microsoft to launch its Windows 2000 to a more skeptical marketplace

When I first heard Microsoft had applied to trademark the word "windows," I was astonished at the arrogance of a company that thought it could own such a commonly used word. Ten years later, both Microsoft Windows and the company's arrogance are legendary. Or perhaps notorious is a

The slow path to Windows 2000 migration

IT managers at large corporations are in no hurry to develop applications for Windows 2000. When do you plan to begin writing enterprise-wide apps for Windows 2000?



better word. The impending release of Windows 2000 is different from previous Windows launches. There will be the usual hoopla, but there's serious skepticism about Windows 2000, according to my research colleague, Senior Associate Editor Jim Battey.

■ Of 400 IT managers at companies with at least 2,000 employees, only 11 percent are already writing enterprise apps for Windows 2000. Thirty percent won't write apps until 2001, and 32 percent said they will never write enterprise apps for the OS (see chart, right). Evans Marketing Services, which conducted the survey in December, contrasted the results with similar research from earlier in 1999. "Corporate America is taking a wait-and-see attitude towards Windows 2000," noted vice president Janet Garvin. "... support for Linux and open-source software is significantly stronger than six months ago and showing signs of growing fast."

■ Giga Information Group estimates that more than half of mainstream Windows 2000 server deployments will take place six to 18 months after the product ships. Of 1,100 IS managers polled by Giga, 47 percent believed Microsoft would deliver a relatively bug-free and easy-to-install Version 1.0; the other 53 percent were skeptical.

■ Mixed-mode environments will be common for the next few years, according to the

of COM+ on page 51. If you're still on the fence, the special news report on page 62 lays out the implementation issues and analyzes other migration trends. Other parts of the package include an interview on page 60 with Jim Allchin, the Microsoft executive most directly responsible for Windows 2000, a look at how to create a successful end-user training program on page 64, and columns by Brian Livingston (page 48), Maggie Biggs (page 59), Bob Lewis (page 66), and the Security Watch team of Stuart McClure and Joel Scambary (page 48).

My personal migration

This is my final column as editorial director of *InfoWorld*. I'm leaving to launch my own company and like CEOs of Internet start-ups everywhere, that's all I can say about it. I've been part of the *InfoWorld* editorial team for seven years, four and a half years as editor in chief or editorial director and two and a half years as a contributing editor.

It's been great to have a front-row view of the technology revolution led by *InfoWorld* readers. When I arrived in June 1995, you and your companies were just beginning to venture onto the World Wide Web. Today, you're using technology to drive your businesses.

I've often boasted that *InfoWorld* readers are incredibly responsive to what you read here and on our Web site. I've personally enjoyed the interaction, and I encourage you to continue it with Editor in Chief Michael Vizard, whose column will appear here.

Sandy Reed has been a technology journalist for more than 15 years. As of Feb. 18, contact her at sandy@reed-ingle.com.



Gartner Group. Windows NT 4.0 will be viable through at least the end of 2004, company officials say, and most companies should plan on a phased migration over a period of several years. Gartner recommends that IT departments get commitments from third-party developers to continue supporting NT 4.0 through the end of 2001.

Whatever your plans for Windows 2000, you'll find useful information throughout this issue and in a special section on our Web site, www.infoworld.com. A good place to start is on page 36, with reviews of Windows 2000 Server, Windows 2000 Professional, and Advanced Server. If you have made the decision to upgrade, don't miss the Test Center Action Plan for upgrading on page 35, the Test Center Action Plan on how to ready your pre-existing Windows apps for Windows 2000 on page 52, and a Test Center Analysis

After pleading and begging for a year and half to have the client get a firewall and a hive box to try to protect a wide-open T1 connection to the Internet and the RAS (remote access server) system, the place got racked, files were deleted (and possibly read, which is even worse), users were down for a day and a half (at an immediate cost measured at over \$1 million), clients were left without services (at an additional loss), etc.

The network did finally receive a firewall, so management wanted to save some money and no protection was afforded for the RAS, so the place has just been cracked again, this time through the modem lines, and the entire e-mail system was wiped out, which means that we'll again close the barn after all the animals have left.

While I only mind this kind of a mess up to point (I get overtime), this brings up a very interesting question: Will you listen to someone who's been doing this for 19 years and spend some money to protect your property right off the bat, or are you the kind of person who hits the Lotto on a regular basis?

Name withheld

Compaq year-2000 issue

THE POWER of Baltimore wrote about the dates changing on his Dell [PCs] (see To the Editor, Jan. 24, page 78).

Well, he's not the only one. I've been working with General Motors in Kansas City, Mo., since April 1999 to make this plant year-2000 compliant. New Year's came, and everything went smoothly.

We purchased about 250 Compaq Deskpro EN series computers, Pentium II 00, and Pentium III 500 systems. All the software and extra hardware on these systems we built are year-2000 compliant. After January 1 hit, the systems started jumping into the future. About 90 out of the 250 are jumping years. We found some in 2036 all the way to 2086. We tested these PCs and found out when booting, so we went into the Compaq CMOS setting and changed the date to the current. We saved all the changes and the systems restarted. We then went right back into the CMOS settings, and presto what? Yep. It's going into the future. We did everything. Even changed the battery; this did it for a couple of days but soon they went "back to the future."

We contacted Compaq [Computer] and talked to a tech support person. That advanced us to the second-level techs, which in turn advanced us to Compaq's engineers. The engineers couldn't duplicate the problem, but sent an on-site tech to the plant and changed the motherboard.

The only difference in the motherboards from what we see is the old one was made in Mexico, and the new one is made in Hungary. Three days of constanty running and rebooting it's still holding its dates. Is any one else having this problem?

Mark Hutchings and Eugene Polk
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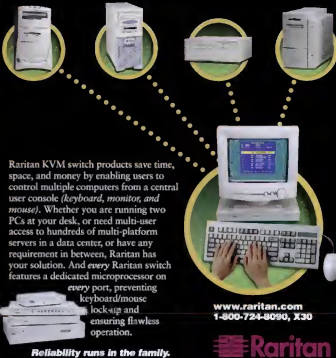
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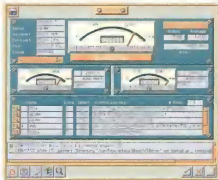
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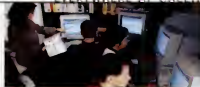
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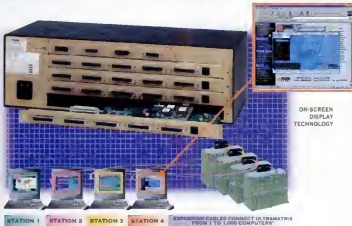
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JOB TITLES

Systems programmer

The title of systems programmer/analyst can encompass several different things, including writing code and doing system administration and analysis.

Compensation

Average salaries

- Nationwide: \$62,198
- West: \$67,025
- Midwest: \$56,222
- South: \$61,309
- Northeast: \$66,021

Percent receiving bonuses

- Profit-sharing bonus: 46.3%
- Annual personal performance bonus: 34.5%
- Team performance bonus: 6.9%
- Bonus for completion of major project: 13.5%

Raises

- Average 1999 salary increase: 7.8%

Satisfaction

- Percent who feel fairly compensated: 69.9%

Statistical statistics

Place in organization

- Average number of direct and indirect reports: 1.3
- Average budget for computer-related equipment: \$1.54 million

Business/technology focus

- Percent who focus primarily on technology: 54.6%
- Percent who focus on both technology and strategic business problems: 40.6%

Highest level of education completed*

- Bachelor's degree: 56.9%
- Master's degree: 27.6%

Time on

- Average workweek: 46.3 hours
- Percent on call after regular working hours: 43.1%
- Percent of those on call who are compensated for it: 22.6%

Time off

- Average vacation, paid sick days, and holidays: 30.3 days
- Percent offered flexible work hours: 74.2%

Career path

The next step for a systems programmer/analyst is fairly wide open. Often systems programmers will move into a senior systems programmer or analyst role where they will take on more team leading[†] and project management responsibilities.*

— Cathy Neubauer, senior technical recruiter, Percom Systems, Reston, Va

Professional resource

Network and Systems Professionals Association (NASPN)
www.naspn.com

—Margaret Steen

Of the 93.4 percent of survey respondents who reported a degree
SOURCES: 1999 INFOWORLD COMPENSATION SURVEY; PERCOM SYSTEMS

INSIDE TRACK

Workplace changes are under way

It's a rocketing economy, and high tech is in the pilot's seat. So what could IT managers possibly need to work for as they ponder their futures? Quite a bit, actually. So don't get caught unaware.

By Eve Epstein

IT PROFESSIONALS seemingly don't have too many career worries, as long as the economy continues to expand, says Ronald Krannich, author of *Change Your Life*. "[IT managers] are in an enviable position," he says.

Still, although IT jobs will remain plentiful, there are some things that you should watch for as you plan your career. Here are some pointers.

1. Job-hopping

Sure, that small start-up with the possibility of stock options and lucrative IPO looming in the future looks appealing. But look before you leap. Make sure that beyond salary or the possibility of an equity stake, other things appeal to you.

2. Expand your skills

And not necessarily just in IT, although by all means you should keep up on technical developments. Consider getting some business training under your belt, especially if you want to move into a company with e-commerce ambitions.

3. Don't count on the boom lasting

Even though high tech is a relatively safe field, you need to operate like an entrepreneur to chart your own career path.

Krannich points to 10 major workplace trends.

- ▶ Most who enter the job market today will have at least 15 jobs and three careers during their work lives.
- ▶ Your job today will most likely disappear in the next five years.
- ▶ The skills you use today will be different from the skills you use in another 10 years.
- ▶ You will need to undergo training constantly to keep up with changes in the workplace.
- ▶ Employers will expect you to take greater initiative and become more entrepreneurial.
- ▶ Your next job will most likely be found on the Internet rather than through classified ads.
- ▶ Careers as we know them are disappearing.
- ▶ You are likely to experience one or two periods of unemployment during the next five years.
- ▶ Employers will become more demanding both in the hiring process and on the job.
- ▶ Expect to face psychological tests, drug tests, behavior-based interviews, and multiple interviews when you conduct your next job search.

CAREERS BY THE NUMBERS

Does your compensation influence your job satisfaction? Participate in our 2000 Compensation Survey at www.infoworld.com/careers.

What's up

190%

Increase in the number of computer systems analysts and computer scientists from 1983 to 1998, according to the U.S. Department of Commerce and Labor.

-37%

Decrease in the number of bachelor's degrees awarded in computer science from 1986 to 1996, according to the U.S. Department of Education.

What's down

Start-up salaries

Companies going public continue to use stock options as a way of compensating top IT employees. Here's a sampling of compensation packages for technical professionals at companies that have recently gone public.

Company	Title	Salary	Bonus	Stock options**	Stock price***
Agency.com	CTO	\$146,410	\$39,646	185,144	\$76.00
Andover.net	CTO	\$125,000	\$19,500	124,048	\$63.38
Fingdog Sports	VP Engineering	\$48,585	None	33,333	\$13.13
NetRatings	VP Engineering	\$107,914	None	129,750	\$28.00
OnDisplay	CTO	\$96,667	None	50,000	\$77.00
OnDisplay	VP, Software Dev.	\$150,001	None	30,000	\$77.00
FreeTime	SVP, CTO	\$155,000	\$71,546	90,000	\$7.75
VA Linux Systems	VP Engineering	\$94,225	\$45,500	665,910	\$239.25
Webvan	SVP, Technology	\$142,974	\$7,692	7,956,000	\$24.88

* Senior Vice President

** Number of securities underlying options granted

*** Per share price at close of first day of trading

Top five states for IT workers

Here are the top five states as measured by the number of high-tech workers per 1,000 private-sector workers.

State	High-tech employment concentration
1. New Hampshire	81.7
2. Colorado	79.7
3. Massachusetts	77.0
4. California	68.5
5. Vermont	62.6

SOURCE: BUREAU OF LABOR STATISTICS

Choosing to outsource

In an InfoWorld study on project management, half of those surveyed said they frequently or occasionally outsource IT projects, whereas the other half said they seldom or never do.



Frequently 14%
Occasionally 36%
Seldom 32%
Never 18%

SOURCE: INFOWORLD RESEARCH

— Compiled by Jim Battey

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Come interact with InfoWorld editors and influential technology experts like Bill Joy, Bob Metcalfe, and Paul Saffo to learn more about the technology strategies and solutions that can help your company turn Internet hype into business reality.

For detailed information about the InfoWorld CTO Forum go to: www.infoworld.com/ctoforum

THE GRIPE LINE • ED FOSTER

Viral marketing goes one step too far — to a place where friends spam friends

ONE OF THE LATEST buzzwords in e-commerce is "viral marketing" — the basic idea being to use the power of the Internet to spread the good news about a product as an epidemic. OK, but is it a good idea for your friends to be able to infect you?

Viral marketing was first coined in reference to the tag-line ads that would appear at the end of messages from the friends of free e-mail services, as in "Do You Whoop?" It's a clever and essentially benign one, that is generally credited for much of the early explosive growth of Hotmail. So now, of course, all the free e-mail services and those of other e-businesses do the same thing. AllAdvantage.com is taking it one dubious step further.

AllAdvantage's basic business model is based on paying customers 50 cents an hour to let the company's "Viewbar" displays ads on their desktops. Nothing wrong about that in itself, but the problem comes from the AllAdvantage markets this service. Along with getting paid for your own Viewbar time, AllAdvantage pays you 10 cents for each hour someone you refer to their service uses a Viewbar and 5 cents an hour for anyone you refer, in turn, gets to sign on to the service, and so on. These "extended referral credits" can go down four levels, and AllAdvantage says some customers wind up earning \$5,000 a month or more.

One obvious problem with this is that it appears to be an open invitation to spammers to make some quick money by telling 500,000 of their closest friends about this wonderful deal. In fact, when I first started getting gripes about AllAdvantage, I assumed it was yet just another bulk e-mail pyramid scheme. Most of the messages that I've seen promoting it are clearly from your typical spammer types, and many of my regular spam-forwarders get at least a few spams promoting AllAdvantage every month.

There were a few indications, however, that AllAdvantage wasn't just another bulk mailer. One thing I noticed was that the numbers identifying the person who is supposedly to get the referral credit were rarely repeated, which indicated that somebody was stripping the spammers under control. On the AllAdvantage Web site, there were warnings at spam was indeed a naughty thing and anyone caught doing it would forfeit their earnings. There was even a list of cancelled accounts, which included some of the identification numbers of those who spammed my desk.

The final piece of evidence that AllAdvan-

tage was not just a spam front came when I called the company and found myself speaking with its chief privacy officer, Ray Everett-Church. You may remember Everett-Church as a board member of the Coalition Against Unsolicited Commercial E-Mail (CAUCE), which helped defeat the infamous Murkowski Amendment that would have legalized spam (and which innumerable spammers to this day still cite in their messages as if it had passed), so his anti-spam credentials are solid. And he says AllAdvantage recognizes that it must prevent spam and is committed to educating customers to ensure they know what spam is.



"When we discover a credible report of spamming, the account is suspended while we investigate," Everett-Church says. "If there is clear evidence of additional abuses, the account is terminated and any referral monies due go into an anti-spam fund. In cases where it appears they just didn't understand what they were doing was wrong — say a kid spammed his economics class — we'll smack them around a bit and make sure they understand it's a violation before we give them a second chance."

Everett-Church's example of a student sending e-mail promoting AllAdvantage to his economics class raises the more important issue here, and the one that prompted a few gripes from readers who received AllAdvantage pitches from people they knew. Who is and who is not appropriate to recruit to AllAdvantage for a referral fee? Is it OK to promote AllAdvantage to everyone in your company, or your department, or just those you some-

times lunch with? If I send my mother a message suggesting she join AllAdvantage, it's still acquaintance spam; it's an unsolicited e-mail with commercial intent. Where is the dividing line?

Everett-Church said he doesn't have an answer to that critical question. The commercials during last week's Super Bowl were all the evidence we need of the huge amount of money companies are ready to spend to drive customers to Web sites, and a couple of ads sounded like they were adopting a similar version of AllAdvantage's approach to viral marketing. Perhaps the day is coming when most of us will get more unsolicited commercial e-mail from friends than from strangers. If so, I fear the epidemic may prove fatal to the internet.



Got a complaint about how a vendor is treating you? Write to InfoWorld's reader advocate, Ed Foster, at gripe@infoworld.com.

NOTES FROM THE FIELD • BY ROBERT X. CRINGELY

Feeling a bit like Austin Powers, Bobby sets out to find his lost mojo online

WITH ROSE GONE, my chance of home ownership flushed down the toilet, and no chance of scoring a BMW for being an InfoWorld columnist, I've been looking to make a fresh start.

Just because all of these twenty-something things with Internet startups have made piles of money doesn't mean that you have to be young and rich to be a success. Besides, I like to measure myself by the tips I get and by my amazing charm and wit, particularly when it comes to women.

Chattering away

So, before I got too rusty, I decided to try out that charm and wit again on some of the ladies in the online chat rooms. To make the job easier for myself, I thought I'd buy IBM's Cordless Computer Connection so I could take my laptop into the living room, the kitchen, and even the bedroom and still be connected.

But IBM's Web site — the Web site of the company that advertises itself as the place to go for all your e-commerce needs — was broken. I clicked on "buy it" and got a blank page. I guess I'll take my charm and wit elsewhere.

Windows shopping

Although many of the IT executives I've spoken with recently have taken a wait-and-see approach to Win2000, the U.S. Coast Guard has taken its fear of Windows one step further. The Coast Guard has implemented a new policy to cut down on the wanton and reckless use of Microsoft Access — the system on every desktop at the Coast Guard — by requiring users to seek specific permission if they plan to use the database program that is part of Microsoft Office. The policy says, "These procedures are not intended to stifle creativity or innovative use of our standard tools." Just requiring permis-



sion before exercising that creativity or innovation, I suppose?

Point, click, and do the math

The creativity of one dot-com start-up recently got it into trouble.

Pointclick.com's business model — one of the Web sites that pays users to surf, or, more realistically, to click, on the advertisements on the site, is having financial problems. Over one recent weekend, the company reduced the balances in the accounts of its users by 80 percent. And e-mails to the company questioning the change have gone unanswered. The site's users say that they have yet to see payments from the company since it started up four months ago.

Advertisers have even lost faith, with their numbers dropping by 60 percent in the last few weeks, one user reports.

Those millionaire dot-coms aren't so successful after all. But who's counting?

Mini-ME

Microsoft's release of Windows 2000 later this month will be followed by the release of a new OS targeted specifically at consumers, Windows Millennium. The announcement prompted one reader to suggest a new name for Microsoft's OS for handhelds. Instead of Windows CE, let's call it Windows mini-ME.

MAYBE I'VE LOST my mojo, so I'm thinking about hiring a sidekick of my own: an intern. This should be interesting.

Pointers on hiring an intern? Send them to me at cring@infoworld.com.

DOWN TO THE WIRE · NICHOLAS PETRELEY

The network computing and Linux 'Tivolution' has arrived and is upon us

THERE'S A SAYING among some pastors that if you don't have a substantial portion of your congregation complaining about the content of your sermons each week, you must not be preaching the truth.

I try to remember that when I sift through my reader mail, because I have a rather substantial number of critics who never fail to let me know when I've annoyed them.

Their two favorite hot buttons are network computing and Linux. They see both as dead-end technologies that I am driven to pursue only because I am blinded by my hatred for Microsoft and Windows. Well, I won't bother trying to set anyone straight as to my rather complex feelings about Microsoft, but I must admit that I do hate Windows because it has so shamefully lowered our expectations of what quality software should be.

Anyway, I mention the above because I'm going to push both hot buttons this week. I've been playing with a set-top box called Tivo, which is a network computer based on

Linux and other open-source software.

Tivo is essentially an ingenious set-top computer that actually does something other than bring Web browsing to television.

Instead, Tivo enhances the television experience, making it more personal.

For example, Tivo records everything you watch onto an internal hard drive as you watch it.

If the phone rings during your favorite show, just press pause. Tivo will continue to record the program so that you can pick up where you left off after your phone conversation.

If you don't quite hear what someone is saying during a program, just rewind a little and listen to that part again. These may seem like trivial advantages to you, but believe me,



it is very easy to get spoiled with features such as these once you get used to them.

You can also tell Tivo to record programs, much like you can program a VCR. Only Tivo makes the experience simpler, more reliable, and can play back shows with a much higher quality than possible on VHS videotape.

As for simplicity, rather than program your VCR for a date and time, you can search Tivo for a program such as *Dilbert* by browsing a listing that Tivo downloads periodically.

Then you can "buy a season ticket" for *Dilbert*, to put it in Tivo's terms. Tivo will then record every occurrence of the *Dilbert* cartoon even if the network programmers change the time slot for the show.

The Tivo remote has two buttons that let you rate programs by giving them one or more thumbs-up or thumbs-down marks.

Eventually, Tivo is supposed to be able to figure out what shows you're likely to want to watch and then automatically record them without asking. I dislike this

feature myself, because Tivo has made some really idiotic decisions about what it thinks I like. But the feature doesn't really get in the way.

There are a few other things I dislike more about Tivo, the worst of which is how badly it commandeers my digital cable box via its

infrared emitters.

If I hit the next or previous channel button too quickly, the Tivo and cable box frequently get out of synchronization. Getting the two back in sync can be a momentarily frustrating experience.

Because Tivo has to dial in to the Tivo network to get things such as program listings, it is relatively easy for the company to upgrade the software in its Tivo boxes. So I'm hoping that I wake up one day to find that Tivo fixed the channel-switching problem overnight. And because it's based on Linux and not Windows, I can safely assume that won't need to reboot the system after Tivo downloads and installs the upgrade.

If you get a Tivo unit, you'll never know you're running Linux. Tivo has added its own flashy graphical user interface, which is surprisingly excellent for such a new product.

If you suspect Linux at all, it will be due to its robust behavior. I deliberately unplugged the Tivo box a few times during critical operations just to check how much trouble it would get into. It came back up flawlessly each time.

Even with its problems, it is easy to get hooked on the Tivo. If this is any indication of what's to come of the marriage of network computing and Linux, I'll be excited no matter how much hate mail I get.

Nicholas Petreley is editorial director of *Reach World* (www.linuxworld.com). Reach him at nicholas_petreley@info.world.com, and visit his forum at www.infoworld.com.

FROM THE ETHER · BOB METCALFE

The story of the rebirth of a company, Gofish.com, a B2B exchange for ... fish

GOFISH.COM IS NOT an online card game. It's a business-to-business exchange company for the seafood industry.

The company was founded three names ago, in 1985, on the working waterfront in Portland, Maine.

Today, Gofish.com is a born-again start-up, doing commerce on the Internet. Yes, it's what we call a "dot-com," located in Maine but with Silicon Valley venture capitalists and an IPO in mind.

I don't often offer punditry about dot-coms. Not about business-to-business (B2B), business-to-consumer (B2C), consumer-to-business (C2B), or consumer-to-consumer (C2C) dot-coms. It's not really my job to help you find fresh fish. So forget fish and hear the B2B story of Gofish.com.

Once upon a time, Neal Workman wanted to be president of Dun & Bradstreet (D&B). But they (www.dnb.com) sent him to Portland, Maine.

So in 1985, Workman founded Debt Management Services, a collection agency for fishermen. He showed up in far-flung offices to get fish buyers to pay their bills. Reminds me of your years breaking the legs of Ethernet deadbeats.

In 1987, Workman started avoiding rather than collecting from deadbeats. He started faxing credit reports to fishermen out of his database of buyers. He renamed his company Seafax.

For the next 10 years, Workman sold company reports, a credit appraisal index, and accounts-receivable protection services. Because buyers of fish often buy other perishables, he started offering credit services to, for example, poultry pack-

ers. Then he began offering his database to anyone wanting to sell anything to credit-worthy fish buyers.

Revenues exceeded \$4 million per year. In 1997, Workman took Seafax online. In 1998, he invested \$1 million to get on the Internet. In 1999, he began delivering daily news wires and posting fish market information via the Web.

Workman is now the head of Gofish.com, "the world's premiere online source for seafood industry information." He started taking transactions in November and posted \$1 million in December.

Peter Murray, a Maine-lac formerly of Next Software, leads the Gofish.com software team. Gofish.com uses Apple's WebObjects to release new fixes and features every Friday night — "fast, furious, and fun."

Gofish.com not only connects buyers and sellers, but also ensures credit. Next it will finance transactions. After that, auctions.

One challenge is rating product quality — not all frozen blocks of haddock are the same.

Another challenge is collecting the 1 percent to 2 percent transaction fee after a buyer and seller have been introduced.



Workman is raising tens of millions finance his doubling company. He is moving to open offices down the street. He is offering stock options to his employees. Gofish.com is a full dot-com.

Of course many B2B exchanges are cropping up on the Internet. There are who books on the subject — for example, *B2B Exchange: The Killer Application in the Business-to-Business Internet Revolution*, by Arthur Sculley and William Woods.

I recommend *B2B Exchanges* not only because Arthur Sculley is the brother of a former Apple CEO who summers in Maine, but also because he mentions Metcalfe's Law.

Sculley and Woods are so enthusiasts about the Internet that my law is not enough for them. Instead they use, from *New Rules, the New Economy*, Kevin Kelly's Law — (not a value of a network of N users grows (not as squared but) as N to the Nth power. When Sculley and Woods lay out seven secrets success with exchange examples from paper plastics, metals, shipping, credit, risk, icals, electricity, and research supplies. www.b2bexchanges.com.

Now my favorite question is, how do you keep secret friends from manipulating markets by selling rotten fish to one another at inflated prices — you know, the way that dot-com stocks on the exchanges in New York

Technology pundit Bob Metcalfe invites you to bookmark his column archive at www.infoworld.com/metcalfe.

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